

# STEEL

The Weekly Magazine of Metalworking

VOL. 129 NO. 2

JULY 9, 1951

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**Next Week ... Military Packaging of Metal Parts ... Quality Control—It Works in Small Plants Too ... Troffer Beams Support Ceiling-Lighting System ... How Design Factors Affect Lining Life of Hot Metal Cars and Mixers**

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# PAY LESS

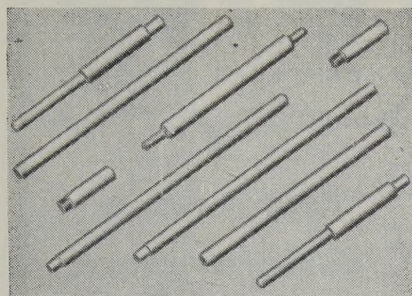
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# Behind the Scenes...

## Theory

Lately we have seen a number of elaborate jokes, cryptic comments and business dictionaries (one of which we ran June 25). Who writes those things? Who has the time to figure them out?

We don't know, but we have a theory. Many of them emanate from Washington sources. We figure that either business men cooling their heels waiting to see some one in the government or federal personnel with a little time on their hands think them up.

## All's Calm

You'll be relieved to know that things are pretty stable in the axe, hatchet and hammer industry, according to a report to National Production Authority by an advisory committee from manufacturers of those products.

We have read dozens of reports from similar committees, and this is one which has the fewest complaints—no axes fell, no one got scalped, no particular problems had to be hammered out.

## Now We Know

Five of Washington's newly established defense agencies bought 145 executive desks, for \$41,000, but only 143 davenports, for \$26,500. Here is a clear case of discrimination. Two executives are going to be without a couch.

The five agencies bought 1324 secretaries' desks, for \$140,000. All the executives can have nine secretaries apiece, with 19 left over. We suggest that the two officials without davenports get nine extra secretaries apiece as compensation. That leaves one floating desk and secretary which we suggest be kept in standby condition.

## Scrap Scoop

We have the inside story on the kitten that still lived although baled in a half-ton of scrap iron. Both AP and UP carried the item, but not in the detail garnered by Chicago Editor Erle Ross.

Employees of Alter Co.'s West Davenport, Iowa, salvage yard were startled when they heard a distinct "meow" from inside a bale of scrap. The bale had been compressed the day before under pressure of 2000 pounds per square inch. Workers laboring 45 minutes pulled the bale

apart and found a two-week-old kitten virtually unhurt. Here is our scoop: The kitten was not killed because it was inside a wire spool, the cylindrical section of which withstood crushing. A second kitten, not mentioned in UP and AP releases, was found dead.

## Geometry: The Answer

Now we know why we never became a great creative engineer: Our knowledge and understanding of geometry has always been inadequate. Dr. Ernst F. W. Alexanderson, radio and television pioneer who has just been awarded his 320th patent for inventions made during his 49 years with General Electric Co., says that "the ability to solve geometry problems should be the first consideration in any intelligence test for engineering." He claims that the solution of geometry problems requires the use of imagination.

Dr. Alexanderson has averaged one patent every seven weeks during his service with GE. He gave the first public demonstration of television projected on a theater screen in Schenectady in 1930.

## Puzzle Corner

Each contestant would run 1800 yards in the June 25 problem about the potato race. First in with those correct answers were Ralph Pappenheimer of Specialty Device Co. and Robert W. Huff of Canton, O.

An airplane has a maximum speed, in level flight, of 375 mph. and its minimum flying speed is 90 mph. In tests it is flown with full throttle, at various angles of climb; and the speeds corrected for windage are:

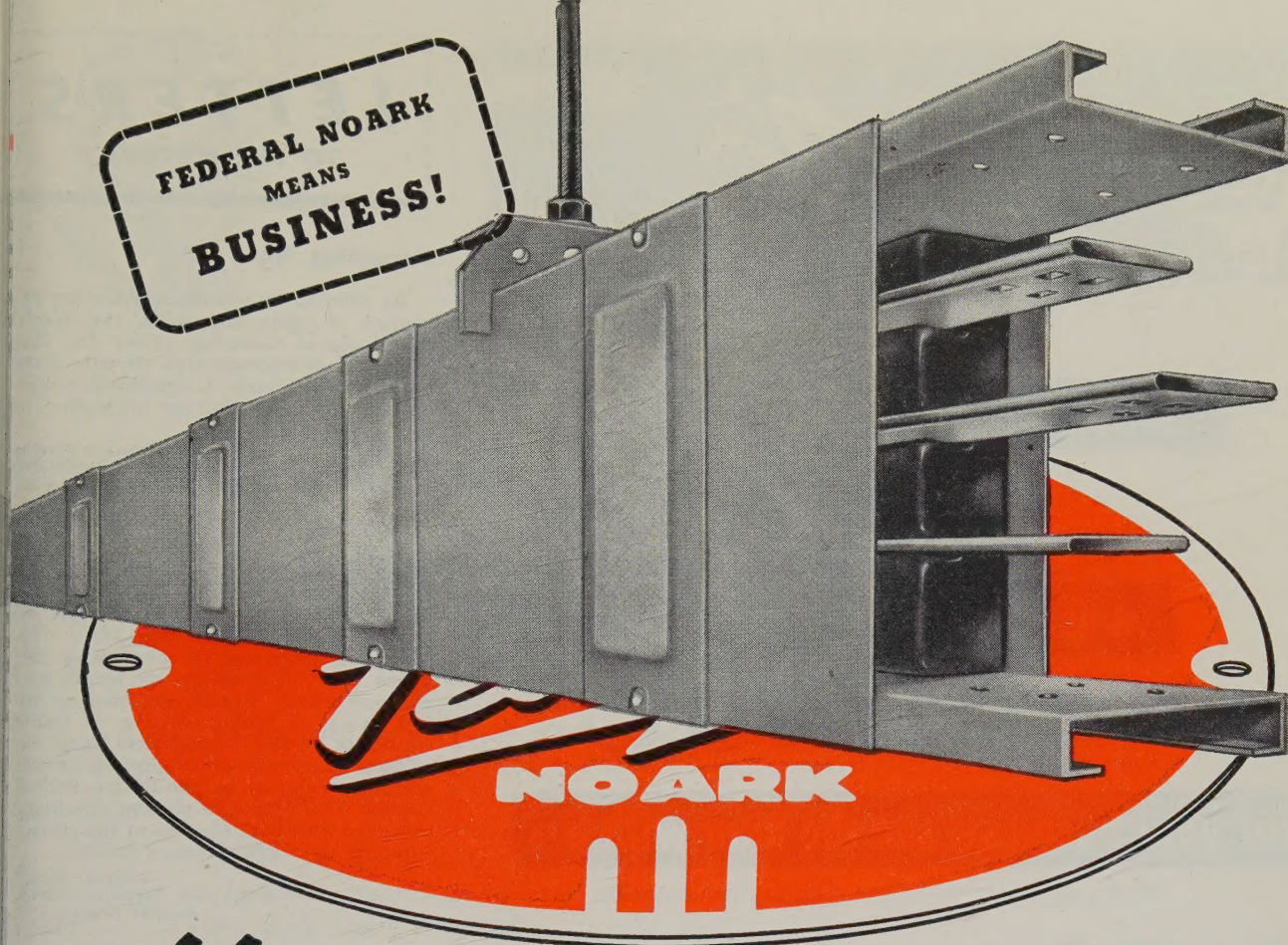
Angle of Climb	Speed in mph.
0	375
5	370
10	360
15	345
20	325
25	300
30	270
35	235
40	195
45	150
50	100

At a greater angle the plane would stall and tend to fall off. From these data find the most efficient angle of climb to gain altitude in the shortest time; and also find that rate of climb in feet per minute.

*Shradu*



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BUSINESS!**



# *Most for your money!*

FOR MAXIMUM SPEED of installation...topmost maintenance economy...operational ease, safety and efficiency...the Federal Noark Bus Duct system is today's best buy.

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**Interlocking Four-Channel Steel Housing**... welded and screwed together to assure greatest strength. Even the longest runs are bound to be straight and true.

**Extra Rugged Interior Construction**...with the bus bars rigidly held by porcelain insulated receptacles every twelve inches.

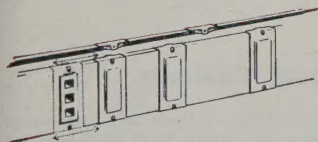
The bus bars are designed to withstand heavy fault currents.

**Positive Contact**... bus bars are silvered over their entire length. Plug-in stabs reinforced with heavy steel springs.

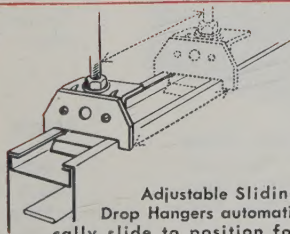
**Insulated Plug-In Openings**...no bus is exposed...operator is safe when changing plug-in device. For extra protection, new hook-on bars support plug-in device during installation.

**Unsurpassed Heat Dissipation**... staggering of insulators on alternate sides of duct provides continuous air passage and coolest operation.

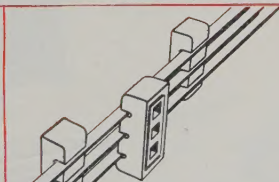
Federal Noark Bus Duct is factory-assembled in 10-foot sections, and completely flexible for future needs. For the full story, write Federal Electric Products Company, 50 Paris Street, Newark 5, New Jersey.



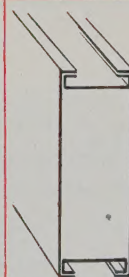
Sliding, self-locking cover plates, protecting insulated plug-in openings, safeguard electricians.



Adjustable Sliding Drop Hangers automatically slide to position for exact alignment... slash installation time.



Bus bars supported by insulated receptacles every foot... ensure maximum safety under heavy short circuit conditions.



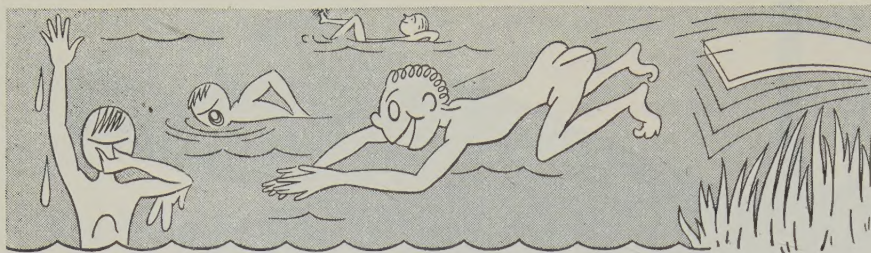
Interlocking four-channel construction assures greatest strength... even long runs are straight as a plumb line.

## **FEDERAL NOARK**

Complete line of Federal Electric Products includes Motor Controls, Safety Switches, Service Equipment, Circuit Breakers, Panelboards, Switchboards, Control Centers, Bus Duct ★ Sales offices in principal cities.







**When a good**

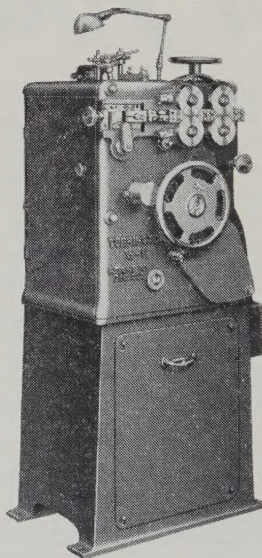
**will be a**

*Spring  
Tonic*

**for your business, see the man with a**

## **Versatile Torrington Spring Coiler**

In spring coiling, the words "Torrington" and "Versatile" are synonymous! When you desire springs produced to meet exacting requirements, just call the professional springmaker who has a Torrington coiler. He's the man who can fill your needs with accuracy, speed and economy. On special springs, our sales department will gladly assist you in finding a source of supply, or help your springmaker devise just the right tooling to produce it.



**MODEL W-11 SPRING COILER**

The 14 different Torrington Spring Coilers cover a range of wire diameters from .003" to .750".

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Wire diameter range: .015" to .072"

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Coil Range (O.D.): 3/32" to 1-9/16"

Production: 23 to 190 springs per minute with variable speed drive.

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## **LETTERS TO THE EDITORS**

### **Assenting Note**

By offering an opportunity for the exchange of ideas and skills, the World Metallurgical Congress, under Dr. Zay Jefferies, director-general (STEEL, June 11, p. 76), can make a significant contribution to the production know-how of the free world.

Charles Sawyer  
Secretary of Commerce  
Washington 25, D.C.

### **Dissenting Vote**

I take exception to "New Light on Shot Peening" (STEEL, May 14, p. 79). You state there was no relationship between the Almen sample arc height and endurance limit. Results obtained by my two years of fatigue testing of valve springs at Wright Aeronautical Corp. indicated an optimum shot peening intensity for maximum fatigue life on helical springs. This optimum peening intensity will vary with both the size of the spring wire and the surface carbon content.

John A. Bugge  
Aircraft Gas Turbine Division  
General Electric Co.  
Detroit

• Other engineers also may take exception to some of those findings on shot peening. A major spring company, which conducted the experiments, was the source for our information.

### **For Mexican Applications**

Please send me the complete description of the pilot plant results, as well as any additional data on the Milton process, as outlined in "Sponge Iron, a Remedy for Scrap Shortage?" (STEEL, June 11, p. 92). We have in Mexico rich iron ores to which we could apply this process successfully.

Francisco Diaz Covarrubias  
La Vld No. 103  
Colonia Nueva Santa Maria  
Mexico 16, D.F.

• The author of that article, P. E. Cavanagh, Ontario Research Foundation, Toronto, Canada, is sending additional data.

### **More About Coolants**

What's the name of the Ohio company which claims "a seven-fold increase in cutting tool life between regrinds following introduction of a new type of chemical coolant" as stated in your June 4 issue, p. 87?

H. J. Mieskiewicz  
Remington Arms Co.  
Ilion, N. Y.

• We have no way of substantiating those claims which we presented as such. Further definite information may be obtained by addressing K. E. Karlson Co., 1836 Euclid Ave., Cleveland.





July 9, 1951

## Two Yokes

In observing the 175th anniversary of the signing of the Declaration of Independence, an unusually large number of American citizens last Wednesday read the text of that important historical document. Many hesitated and pondered when they came to these words:

"Prudence, indeed, will dictate that governments long established should not be changed for light and transient causes; and accordingly all experience hath shown that mankind are more disposed to suffer, while evils are sufferable, than to right themselves by abolishing the forms to which they are accustomed. But when a long train of abuses and usurpations, pursuing invariably the same object, evinces a design to reduce them under absolute despotism, it is their right, it is their duty, to throw off such government, and to provide new guards for their future security."

This explanation precedes a list of 27 specific acts of oppression by the King of Great Britain. As Americans read these charges today, they compare the ills they suffered under King George III in 1776 with their trials and tribulations in 1951. Many feel that some of the major complaints against the King's rule are similar to those which can be charged against our government in Washington today. As a result of happenings occurring largely within the past two decades, our government has become so large, so bureaucratic and so powerful that its demands upon the people for excessive taxes and unwarranted sacrifice of individual freedoms are almost as obnoxious as those of King George.

What we need most today is a rebirth of the spirit of 1776 that will alert American citizens to the importance of preserving their rights. We have in Washington a few representatives of the people in both parties who are aware of the danger of our present too-powerful, bureaucratic government. They need the support of every right-minded citizen.

Our forefathers shook off the yoke of a King's oppression. Why can't we unite to shake off the yoke of the spend-like-mad, tax-to-the-hilt, scare-'em-to-death, synthetic-crisis, impotent and inefficient administration that is our curse today!

EDITOR-IN-CHIEF

**WORTHWHILE SALVAGE:** In view of the abundant publicity given to the abandonment of military equipment in Pacific islands following VJ Day, it is gratifying to learn that civilian employees of the Army, starting in 1948, have done a pretty good job in retrieving part

of the discarded materiel. They have collected about 200,000 tons of unserviceable major ordnance items, which would have cost \$500 million to replace.

This materiel was shipped to central depots, identified, cleaned, preserved and repacked for



reshipment to points where it could be utilized by the Far East Command. Under this procedure, a 2½-ton truck costing \$2700 in World War II, can be rebuilt for \$1000, whereas a new truck would cost \$7000. Economy of this kind is rare today. Taxpayers would like to see more of it. —p. 44

\* \* \*

**RECORD PLANT OUTLAY:** Regardless of what happens in Korea, expenditures for new plant and equipment in 1951 will top the \$18.6 billion spent in 1950, the \$18.1 billion in 1949 and the previous high of \$19.2 billion in 1948. According to estimates of Securities & Exchange Commission and Department of Commerce, outlay for new plant and equipment for the first nine months of this year will reach \$17,980 million and expected outlay in the final quarter will lift the total for the year to around \$24 billion.

Largest expenditures are for the manufacturing industries. A study by Defense Production Administration shows that from 1939 to 1951 the percentage of total expenditures for manufacturing facilities has shifted moderately geographically. The percentage of the total has not changed appreciably in New England, Middle East and South East. The Central region and the Far West have lost, whereas the South West has gained substantially and the North West slightly. —p. 43

\* \* \*

**SELLING THE "FIELD":** Glancing through the "success" story of the ten-year program of Osborn Mfg. Co. to develop its power-driven brush business, one comes upon this arresting sentence: "Keystone in the new policy was the decision to sell brushing first and Osborn brushes second."

Here is a text which has wide application in the metalworking industries. Stiff competition prevails in most sectors of this field. The temptation to sell by comparing the superlative values of your product with the inferior qualities of your competitors' products is strong. However, no matter whether you are selling castings, forgings, weldments, pressed metal parts or what not, the chances are good that if you sell the field first and then use every legitimate means to get your share of the business,

you will fare much better than if you try to sell by disparaging the other fellow's product.

Sell welding, castings, stamping, etc. first; then your own strong points. —p. 54

\* \* \*

**PROBE GRAY MARKETS:** In a period when Senate investigations seem to be quite popular, the freshman senator from Michigan is inaugurating an examination of government policies with respect to the allocation of steel. Blair Moody, ex-Washington newspaper correspondent who succeeded the late Arthur Vandenberg, heads a subcommittee which probably will begin its activities with hearings on gray market operations in Detroit.

Every steel producer and consumer will be interested in the outcome of these hearings. Many major sellers have wondered how certain tonnages from their mills have drifted into the possession of persons who definitely are not on their customers' lists. Numerous buyers are confused by the apparent ease with which some customers seem to be able to get supplies while others report great difficulty or failure. All concerned will watch the Moody investigation closely, wondering whether it will uncover facts not already known. —p. 57

\* \* \*

**NEW CARTRIDGE CASES:** According to the competent ordnance experts, we are entering a period in which the time-honored artillery cases of brass will be replaced by cases of steel. The transition will not be easy. The men who do the fighting have a strong preference for the brass product, but technological and economic factors are making the change imperative.

On the economic side, copper and zinc required for cartridge brass are not available in sufficient quantity. From the technical standpoint, new weapons and ammunition now under development require physical properties in the cartridge case that are decidedly beyond the range possible in brass alloys but are easily within the capacity of steel.

Therefore we are confronted with a problem, first, of perfecting techniques to enable manufacturers to produce steel cases economically and secondly, of convincing the artilleryman that the ferrous shell is O. K. Present progress indicates that both hurdles will be surmounted.

—p. 72



# Capital Outlays Will Hold High

Whether war or peace in Korea, peak expenditures for new plant and equipment—a major support of the economy—should continue, for perhaps a \$24 billion total in 1951

NEW PLANT and equipment expenditures may exceed \$24 billion in 1951, Korea or no Korea.

Nobody can yet know what peace in Korea will do to the American economy as a whole, but accurate estimates can be made for capital outlays because commitments for that major support of the economy have already been made pretty much for the entire year. Economists agree that a chief bulwark of the present boom is expenditures for industrial construction and producers' goods.

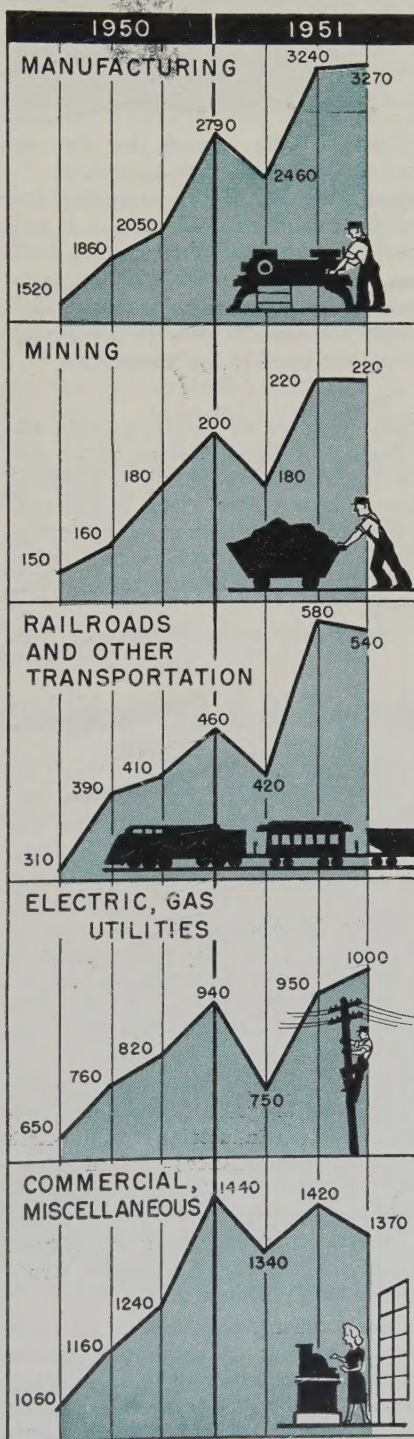
**Still High**—Even if capital outlays do decline, the dollar volume probably will still be above the \$18.6 billion spent in 1950, the \$18.1 billion in 1949 and the previous record of \$19.2 billion in 1948. The charts on this page indicate that total third-quarter expenditures, as estimated by the Securities & Exchange Commission and the Department of Commerce, have already been set at \$6.4 billion. Outlay for the first nine months of 1951 will reach \$17,980 million, the U. S. agencies estimate. That's practically at an annual rate of \$24 billion. The \$24 billion will be spent if total fourth quarter expenditures hit \$6 billion, \$400 million below expected third-quarter outlays and \$420 million less than actual second-quarter expenditures.

Some of the dollar gain in 1951 capital expenditures is accounted for by inflation. Prices now are about 10 per cent higher than average levels in 1950 and 1948. Adjusting the 1951 expected capital outlay of \$24 billion to 1950 and 1948 price levels, you still get \$21.6 billion, 16.1 per cent above 1950 and 12.5 per cent above 1948.

**Biggest**—A glance at the charts shows that expenditures for new plant and equipment by the manufacturing industry are the largest of outlays for all categories; they have also risen the most. Expenditures in the manufacturing category for this third quarter will be 59.5 per cent above those of the third quarter in 1950; 22.2 per cent higher in mining; 31.7 per cent greater in transportation; 21.9 per cent for electric and gas utilities; and 10.5 per cent in commercial and miscellaneous classifications. Nearly half of manufac-

## Plant and Equipment Expenditures

(Quarterly figures in millions of dollars)



Sources: Securities & Exchange Commission and Department of Commerce

turers' capital outlay this year is for iron and steel production facilities.

Certificates of necessity permitting five-year amortization rights on expansions have been granted almost entirely for manufacturing projects. A study completed by Defense Production Administration reveals that manufacturers who are expanding under the amortization program are turning more and more to such states as Arkansas, Texas, Oklahoma and Colorado.

**The Scene Shifts**—DPA has figured (see the table below) the geographic distribution of manufacturers' expenditures for new plant and equipment in 1939 and 1947 and has compared it with the geographic distribution of tax amortized projects approved as of May 7, 1951. In the amortization program, New England, Middle East and Southeast states account for about the same proportion as in the earlier two years. But the Southwestern states will have about 15.5 per cent of the amortized total, in contrast to an average of 5 per cent in 1939 and 1947 for that area. The Central states' share is reduced from an average of more than 36 per cent in 1939 and 1947 to 23 per cent in the accelerated amortization facilities expansion. The Northwest also gained, but, surprisingly, the Far West area dropped.

### The Sections Where Manufacturers' Capital Expenditures Go

(per cent of total outlays)

	1939	1947	1951
New England	8.2	7.0	7.7
Middle East	28.9	26.1	28.6
Southeast	12.6	13.8	14.4
Southwest	4.5	5.7	15.5
Central	37.3	35.8	23.2
Northwest	2.1	2.3	5.5
Far West	6.5	9.3	5.0

### Kaiser, Inland Get Tax O.K.'s

Two steel producers received certificates of necessity permitting them to accelerate tax amortization on expansion projects. They are Kaiser Steel Corp. and Inland Steel Co.

Kaiser was given special tax benefits on a \$54,939,000 program to build a blast furnace and related facilities at its Fontana, Calif., plant. This will be the third blast furnace there. One furnace was blown in in December, 1942, in connection with the building of the Kaiser Fontana mill during World War II. The second stack and additional coke ovens started operating in October, 1949.

The Fontana plant was built origin-



ally to produce plates, structurals and bars. The Kaiser company is now rounding out its finishing facilities. It installed a new hot strip mill and also added facilities to produce line pipe and small diameter pipe. A tin plate mill is now being installed.

Inland is not planning steel ingot or finishing facilities beyond those announced some time ago. The 70 per cent of \$6,809,386 just allowed for fast amortization covers some of the cost of materials handling equipment already installed and also part of the cost of a new coke oven battery completed last September (STEEL, Sept. 25, 1950, p. 46). Just last month Inland was allowed 75 per cent fast amortization of the \$29,400,600 cost for expanding steel ingot facilities. That work will raise ingot capacity to 4.5 million tons. Inland also in June was allowed 80 per cent of \$3,015,000 for dieselizing two ore carriers and lengthening the *P. D. Block*.

## New Blast Furnace at Neville

Pittsburgh Coke & Chemical Co. awarded Koppers Co. Inc., Pittsburgh, contracts for the building of a new blast furnace at its Pittsburgh Neville Island plant. The new furnace will be designed and constructed by the Freyn engineering department of Koppers Engineering & Construction Division. It will have a hearth diameter of 22 feet and will be capable of producing about 850 tons of pig iron per day. Pittsburgh Coke & Chemical now has one other blast furnace of about the same size; the new addition will double capacity.

## Republic Gets Coke Facility

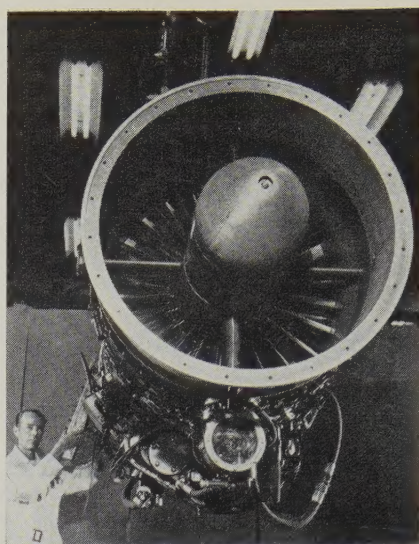
Niagara Mohawk Power Corp. sold the coke-producing facilities at its Troy, N. Y., coke and gas plant to Republic Steel Corp., Cleveland. The facilities adjoin Republic Steel's blast furnace at Troy. Coke from the Troy plant was continuously purchased by Republic. By the transfer Republic will have its own coke plant besides its blast furnace for the production of pig iron.

## Meeting on Thomas Sale Called

Directors of Thomas Steel Co., Warren, O., called a special shareholders' meeting for Aug. 7 to act on the sale of assets to Pittsburgh Steel Corp. and to dissolve the firm.

## Berry Motors Merged into Oliver

Merger of Berry Motors Inc., Corinth, Miss., into the Oliver Iron & Steel Corp., Pittsburgh, was announced by Theodore F. Smith, president of Oliver. The Pittsburgh com-



**POWERHOUSE:** Ready for the test cell at General Electric's Lockland, O., plant is the J-47-GE-21 jet engine, first of the advanced J-47 series. It puts out far more thrust than current J-47s—rated in excess of 5200 pounds. Accessories have been moved underneath the nose to provide greater air inlet area to the compressor

pany acquires all assets, patents and property of Berry Motors, which will be operated as the Berry Division of Oliver Iron & Steel Corp. It will continue to manufacture rotary power hydraulic pumps, motors and industrial transmissions at the Corinth plant.

Berry only recently emerged from

## Army BIG-5 Saves Vehicles, Equipment in Far East

BECAUSE neither personnel nor facilities were available to crate and ship materiel strewn about the Far East in the wake of rapid demobilization after the last war, most of it was left behind. But in 1948 Army civilian employees from the United States began a systematic combing of Guam, Saipan, Okinawa, Korea, the Philippine Islands and Japan itself for all unserviceable major ordnance items and mountains of unidentified spare parts and materiel.

The vast program (dubbed the BIG-5 for Base Industrial Group—fifth echelon maintenance) netted about 200,000 tons of miscellaneous items that still were useful.

It saved equipment that might have cost \$500 million to replace, the Army Department estimates.

**General Purpose**—The project's aim was rebuilding of general purpose vehicles and power train units for Ordnance support of troops. Reclaimed materiel was loaded aboard LST's and sent to such places as Oppama Ordnance Shop, one of five installa-

the pilot-plant stage of operation and is now in commercial production. Oliver, a manufacturer of industrial fasteners, small forgings and pole line hardware, has been in continuous operation in Pittsburgh since it was founded in 1863 by Henry W. Oliver.

## Trailmobile Sold to Pullman

A majority of stockholders (81 per cent) approved sale of the assets of Trailmobile Co., Cincinnati, to Pullman Inc. Trailmobile will become a Pullman subsidiary and continue to manufacture truck-trailers.

## Big Press On Way to Lockheed

Two 160-ton main sections of a \$750,000 Birdsboro press will be installed soon at the Lockheed Aircraft Corp. plant, Burbank, Calif. Weighing as much as nine army tanks, the crown and bed of the press, loaded on heavy duty, 16-wheel flat cars are rolling westward from Birdsboro, Pa., at reduced speeds over specially selected routes.

The hydraulic metal-forming press, built by Birdsboro Steel Foundry & Machine Co., will weigh more than 2,370,000 pounds when it is completely assembled. Of Lockheed design, it will exert 8000 tons of pressure to produce integrally stiffened wing sections and other parts in solid pieces as large as 10 by 30 feet. Self-strengthened parts will replace units now composed of scores of small parts welded and riveted together.

tions established to carry on the BIG-5 project. More than 800 LST's discharged on Oppama docks the cargo collected from the many islands. From that point it was dispersed through regular supply channels after being identified, cleaned, preserved and repacked with nomenclature, stock number and other pertinent data on the outside of the containers. That enabled the Far East Command to make use of the thousands of spare parts thus saved.

BIG-5, through its established mass production technique, was able to keep fighting men well supplied with automotive equipment at a minimum cost. Current procurement figures, for example, indicate that a 2½-ton truck costs about \$7000. Cost of a similar truck in World War II was about \$2700. The cost entailed by BIG-5 in rebuilding one of the trucks—taking into account the cost of its transportation—was about \$1000.

Taxpayers will be happy to learn that facilities of BIG-5 are still operating.



# Price Rollbacks Out—At Least Until Aug. 1

**Congressional action extending the Defense Act of 1950 to Aug. 1 hamstrings some phases of OPS' pricing curbs and prohibits it from rolling back prices**

PRICE ROLLBACKS on manufacturers' products are out of the picture, at least for a while.

In extending the Defense Production Act of 1950 for 31 days (from June 30 to Aug. 1), Congress prohibited the Office of Price Stabilization from rolling back prices.

**Shelved**—This wing-clipping forced OPS to cancel plans for putting into effect July 2 its new "pre-Korea plus" orders, since they would have brought some price rollbacks. These orders were to have replaced price ceilings set under the general wage-price freeze of last January with new ceilings basing prices on pre-Korea levels plus certain materials and labor cost increases since then.

To comply with the prohibition Congress placed on rollbacks, OPS issued General Overriding Regulation 13 which froze ceiling prices in effect on June 30 for commodities or services covered by specified manufacturers' regulations.

**Affected** — OPS officials said the regulations affected are: CPR 22, Manufacturers' General Ceiling Price Regulation; CPR 30, Machinery and Related Manufactured Goods; CPR 37, Primary Cotton Textile Manufacturers' Regulation; CPR 41, Shoe

Manufacturers' Regulation; CPR 45, Apparel Manufacturers' General Ceiling Price Regulation; and CPR 18-Revised, Manufacturers' Prices for Wool Yarns and Fabrics.

Manufacturers pricing under these regulations, OPS officials said, will remain under the pricing provisions of the General Ceiling Price Regulation, if they had not yet established ceiling prices which became effective on or before June 30, 1951. Manufacturers who had filed new ceiling prices in late June, but who had not yet met the 15-day waiting period requirements before increasing prices, must continue to use their ceiling prices under the GCPR until further notice. In cases where proposed prices were returned for revision, manufacturers must also continue to use their GCPR ceilings. Manufacturers who had already established new ceiling prices under these regulations, whether they constituted advances or rollbacks, are permitted to keep those new ceilings in effect.

**Sit Tight**—Sellers who have not yet filed their reports under the regulations in question need not do so until further action by the OPS. Reports on file are not countermanded, however. Whether such re-

ports containing proposed increases in ceiling prices became effective on June 30, 1951, may depend on the waiting provisions of the regulation. Under CPR 22, reports of ceiling price increases received by OPS after June 14, 1951, will not have the effect of establishing a ceiling price in effect on June 30, 1951, since the 15-day period after date of receipt would not have expired on or before June 30, 1951. Ceiling prices for commodities covered by such filings thus will remain at their GCPR level.

Just before the OPS was bridled, it announced it was postponing indefinitely the effective dates for placing some specific commodities under the general manufacturers' order (CPR 22) and the machinery manufacturers' order (CPR 30). The commodities for which extensions were authorized were to be placed under new specially designed regulations or handled under supplementary pricing provisions.

## Lower Scrap Freight Rates Asked

The Interstate Commerce Commission scheduled a hearing July 24 on the appeal by the Institute of Scrap Iron & Steel Inc. for lower freight rates in eastern territory to reward shippers of heavily loaded cars.

The institute asked for about a 20 per cent reduction in freight rates on cars of scrap loaded to 80,000 pounds or more per car.

An ICC decision still is awaited on the institute's appeal for a reduction in freight rates in southern territory. Since the filing of that case, many reductions were made voluntarily by railroads.

## Roll Maker Faces Antitrust Suit

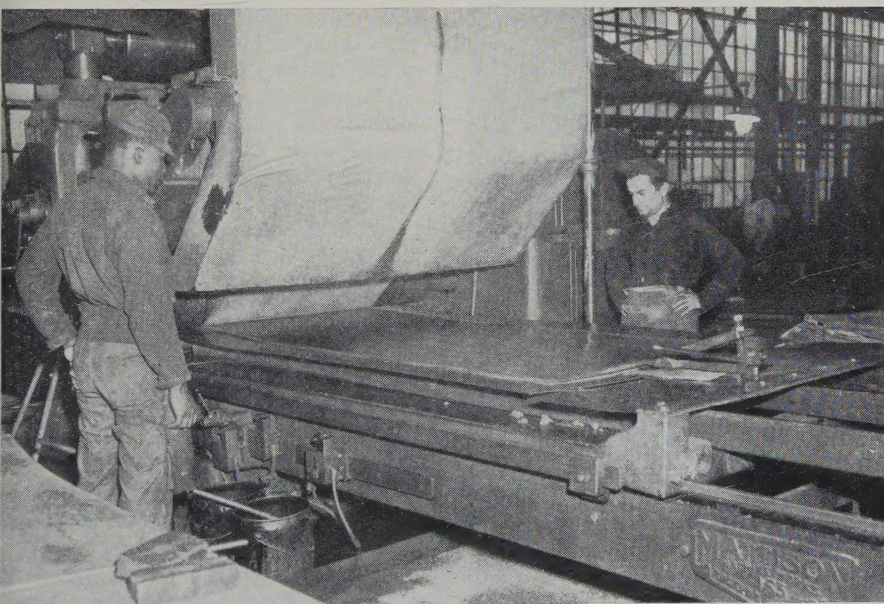
A civil antitrust suit filed by the U. S. Department of Justice charges Blaw-Knox Co., Pittsburgh, participated in unlawful cartel arrangements which restrain interstate and foreign trade in cast metal rolls.

Named as co-conspirators are: Sir W. G. Armstrong Whitworth & Co. (Ironfounders) Ltd., New Castle-on-Tyne, England; Jarrow Metal Industries Ltd., London, England; and John Jarvis, Surrey, England.

## New Chiefs Take Over

Philip R. Bradley has retired as chief of the Ferro Alloy Branch, Defense Minerals Administration, and returned to his business of consulting mining engineer in San Francisco. Replacing him is George B. Holderer, mining consulting engineer.

Weston Bourret, acting chief since April of DMA's Minor and Rare Metals Branch, has been appointed chief.



**PROUDLY IT HAILS:** Span of Alan Wood Steel Co.'s existence—it is celebrating its 125th anniversary this month—covers the major period of the steel industry's development. Installation of its 30-inch hot strip mill is the first in eastern Pennsylvania; its cost: \$9 million. Alan Wood spent over \$21 million in the last five years. Treatment plants for waste water alone involved expenditure of \$1.1 million. Here, two workmen rough grind a perma-clad sheet in the first step of the polishing process



## Multiplying Business

**Sales volume in the calculating and accounting machine industry is well above last year**

BUSINESS is multiplying for makers of calculating and accounting machines—largely because of increasing government controls that make greater demands on clerical staffs in industry.

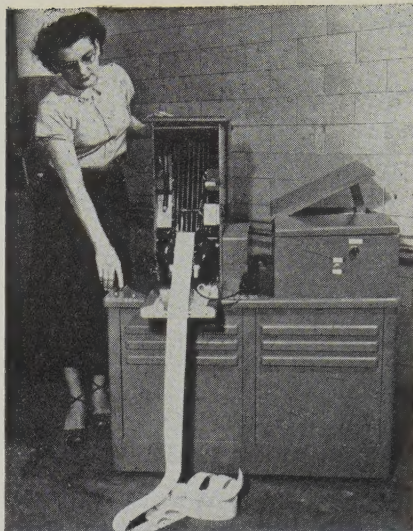
In the first five months of this year, the sales volume of the ten major manufacturers of calculating and accounting machines was about 70 per cent over the same period in 1950. Orders in the first quarter of this year were some 20 per cent above new business placed in the fourth 1950 quarter. In the last 60 days, business has shown some slackening, but it's still high.

**The Reason Why**—Thus, the Korean War has given an impetus to an industry that has already had and expects to have even more long-range expansion. One out of eight in the work force is a clerical person today, for an office force of 8 million. That's 30 times as many office workers as were employed in 1873, when the first business machine, the typewriter, was introduced. Manufacturing employment now is only seven times the 2.1 million employed in all industries about 1870.

In this war, calculating and accounting machines are recognized as essential, and some of the industry's volume is now going to the government. What's more, the industry is well suited to precision defense work and is getting into it. That, plus sales of its equipment to the government, has forced a 35 per cent reduction in output for civilian users. Civilian buyers are having the greatest trouble getting check perforation, stamping, canceling, signing, counting and sorting devices.

**A Little Help**—The essentiality of the equipment has helped manufacturers with materials. Producers of all types of business machines use only 0.3 per cent of all the steel produced. The industry is an even smaller user of brass, aluminum and nickel. While it has problems with materials, the industry finds its major difficulty is with skilled manpower. A company like Burroughs Adding Machine Co. needs all the seasoned labor it can get to turn out the 70,000 different parts its devices require. Most firms in the industry make 90 to 95 per cent of all their own parts.

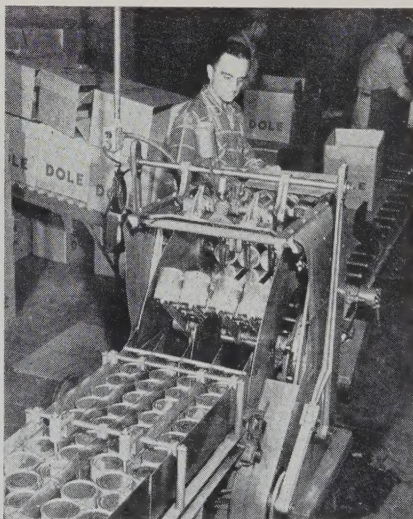
Subcontracting is not too practical a means of boosting calculating and accounting machine production. If manpower scarcities force them to it,



TESTING AN ADDING MACHINE  
... at American Automatic Typewriter

companies in the industry will probably farm out parts that can be handled in job stamping shops. Deliveries of calculating and accounting machines take as long as 12 months. Even on some of the smaller, standard adding devices shipment takes two to four months. That situation has led National Production Authority to consider at least the possibility of distribution controls to essential users. The industry is cool to the idea.

**Research**—New calculating and accounting problems have led to the development of new machines, mainly of the mechanical and electromechanical type.



Wide World

**CAN-HUNGRY:** High speed and non-shock operation are big features of this 1500-case-per hour packaging machine. The caser picks up 12 cans at a time and, in a double operation, places 24 in a box. Upright travel on conveyor belts helps avoid denting or other damage. Only manual operation is loading empty boxes, and that will soon be a robot operation

ical type. There's a great future for electronically controlled equipment, but thus far it is too expensive to manufacture for widespread use. Electronic machines would be used for business accounting if cost were no object. But cost still is an object. At present there is not as great a need for higher speeds in machines as there is for ease of input and output of the information. Business machines are reaching the point where they are without adequate materials handling equipment to and from.

One major development in an electronic machine is an automatic computer with a mercury memory that can retain 80,000 information items simultaneously. It uses 5400 electronic tubes and magnetic operating features. The problem is to simplify it so that more than the present handful of companies can afford to buy it.

## Mechanical Brain Gets Air Borne

A new digital differential analyser built by Computer Research Corp. to specifications of North American Aviation Inc. will soon be airborne and grinding out answers to complicated electromechanical problems high above the earth.

Part of a "flying laboratory" the company is preparing for in-flight testing of guided missile components, the computer has already proven satisfactory for operations under varying conditions of altitude, temperature and vibration—conditions not previously required of a digital mechanical brain. Guidance equipment, such as automatic control and navigation units, can be interconnected with the "brain" which will then do a lot of the "heavy thinking" for scientists.

The new flying brain will provide information the North American scientists seek to support other data obtained with digital and analogue computers in operation in many company laboratories. These grounded computers are being used to flight test both plane and missile components by providing computations based upon theoretical flight data.

## Three Groups Pace Employment

Fabricated metal products, primary metal industries and shipbuilding were three of the six heavy goods industries in the San Francisco-Oakland metropolitan area accounting for more than 72 per cent of the 13 per cent gain recorded in manufacturing employment in April, as compared with the like month in 1950.

Wage and salary workers in the area's manufacturing plants rose to 172,400 persons, an advance of 19,400 over a year ago, says California's Department of Industrial Relations.



# Rating Symbols for Use Under Controlled Materials Plan

HERE'S a complete list of symbols to be used to identify allotments of materials under the Controlled Materials Plan. They were announced by the National Production Authority. Of the 141 symbols, 71 are for use in connection with major defense programs of the government. The remaining 70 are for use in connection with production of goods listed in NPA's "Official CMP Class B Product List."

Sym'l	Major Program Involved	Agency or Industry Div., Etc.		
A-1	Aircraft	Dept. of Defense	H-4	Minor Requirements including MRO (Order M-50)
A-2	Guided Missiles	Dept. of Defense	H-5	Construction
A-3	Ships	Dept. of Defense	H-6	Other
A-4	Tank-Automotive	Dept. of Defense	H-7	Construction
A-5	Weapons	Dept. of Defense	H-8	Other
A-6	Ammunition	Dept. of Defense	J-1	Ship Building for Maritime Account
A-7	Electronic and Communications Equipment	Dept. of Defense	J-2	Private Ship Building Maritime Sponsored
A-8	Fuels and Lubricants	Dept. of Defense	J-3	Construction
A-9	Clothing & Equipage	Dept. of Defense	J-4	Other
B-1	Building Supplies and Equipment for Construc.-Troop	Dept. of Defense	J-5	Construction
B-2	Subsistence	Dept. of Defense	J-6	Other
B-3	Transportation-Equip.	Dept. of Defense	W-1	Construction
B-9	Production-Equipment	Dept. of Defense	W-2	Other
C-2	Dept. of Defense Construction	Dept. of Defense	W-3	Construction
C-3	MRO	Dept. of Defense	W-4	Other
C-9	Miscellaneous	Dept. of Defense	J-7	All
Z-9	Prod. Equip. for certain Priv. Contractors	Dept. of Defense	T-8	Construction
D-1	Construction	Dept. of Army	T-9	M.R.O.
D-2	Other	Dept. of Army	U-1	M.R.O. — Operating Constr. (U-1 Self Assigned)
E-1	Construction	Atomic Energy Commission	U-2	M.R.O. & Operating Constr. (U-2 Application-Authorization)
E-2	Operations (Including MRO)	Atomic Energy Commission	U-3	M.R.O.
E-3	Privately-Owned Facilities	Atomic Energy Commission	U-4	Construction
F-1	Construction	Federal Civil Defense	U-5	Construction
F-2	Other	Federal Civil Defense	Z-1	All (except basketing)
F-3	Construction	Federal Security Admn.	Z-8	Basketing under NPA Reg. 2
F-4	Other	Federal Security Admn.	AM	To transfer aluminum between (a) aluminum producers, (b) aluminum producers and aluminum smelters, and (c) aluminum producers and aluminum distributors.
F-5	Construction	General Services Admn.	FC	To transfer steel between mills for processing into another shape or form which is still a controlled material.
F-6	Other	General Services Admn.	WH	Prefix to warehouse serial number on shipments to replenish warehouse stocks of controlled steel products.
F-7	Construction	Veterans Administration	PM	Identifies purchase of non-controlled materials by controlled materials producers for use as production materials (except for aluminum acquired by use of symbol "AM") (See Direction 2 to CMP Reg. 1) Small Users (See Direction 1 to CMP Reg. 1)
F-8	Other	Veterans Administration		
F-9	Construction	Housing & Home Finance Ag'y		
G-1	Other	Housing & Home Finance Ag'y		
G-2	Construction	Department of Agriculture		
G-3	Other	Department of Agriculture		
G-4	Construction	Defense Transport Admn.		
G-5	Other	Defense Transport Admn.		
G-6	Construction	Canada		
G-7	Other	Canada		
H-1	Construction	Petroleum Admn. for Defense		
H-9	MRO (Order M-46)	Petroleum Admn. for Defense		
H-2	Other	Petroleum Admn. for Defense		
H-3	Construction—Major Plant Additions (Order M-50)	Defense Elec. Power Com.		

## Allotment and Rating Numbers for "B" Products Under CMP

Sym'l	Industry Division		
K-1	Agricultural Mach. & Implements	M-5	Electrical Equipment
K-2	Aircraft	M-6	Electrical Equipment
K-3	Aircraft	M-7	Electronics
K-4	Aluminum & Magnesium	M-8	Electronics
K-5	Building Materials	M-9	Electronics
K-6	Building Materials	N-1	Engine & Turbine
K-7	Building Materials	N-2	Engine & Turbine
K-8	Chemicals	N-3	Engine & Turbine
K-9	Communications Equipment	N-4	General Components
L-1	Construction & Mining Machinery	N-5	General Components
L-2	Construction & Mining Machinery	N-6	General Components
L-3	Consumers Durable Goods	N-7	General Components
L-4	Consumers Durable Goods	N-8	General Industrial Equipment
L-5	Consumers Durable Goods	N-9	General Industrial Equipment
L-6	Consumers Durable Goods	P-1	General Industrial Equipment
L-7	Consumers Durable Goods	P-2	General Industrial Equipment
L-8	Containers & Packaging	P-3	General Industrial Equipment
L-9	Containers & Packaging	P-4	General Industrial Equipment
M-1	Containers & Packaging	P-5	General Industrial Equipment
M-2	Copper	P-6	General Industrial Equipment
M-3	Electrical Equipment	T-5	Iron and Steel
M-4	Electrical Equipment	T-6	Iron and Steel
		T-7	Iron and Steel
		P-8	Leather & Leather Products
		P-9	Lumber & Lumber Products
		R-1	Miscellaneous Metals & Minerals
		R-2	Motion Picture Photographic Prod.
		R-3	Motor Vehicle
		R-4	Motor Vehicle
		R-5	Motor Vehicle
		R-6	Motor Vehicle
		R-7	Ordnance & Shipbuilding
		R-8	Ordnance & Shipbuilding
		R-9	Ordnance & Shipbuilding
		S-1	Petroleum Administration for Defense
		S-2	Printing and Publishing
		S-3	Pulp, Paper, and Paper Board
		S-4	Railroad Equipment
		S-5	Railroad Equipment
		P-7	Railroad Equipment
		S-6	Rubber
		S-7	Scientific & Technical Equipment
		S-8	Scientific & Technical Equipment
		S-9	Scientific & Technical Equipment
		T-1	Service Equipment
		T-2	Service Equipment
		T-3	Textile
		T-4	Tin, Lead, and Zinc

### How To Form Production Pools

Want to know how to form defense production pools? Get a copy of the Defense Production Administration's booklet "Pooling Production for Defense." It explains in simple ABC fashion the steps a group of businessmen must take to band themselves together into a pooled production unit to handle defense contracts and subcontracts.

Copies of the booklet may be obtained from Department of Commerce field offices and from the Distribution Section, Printing Services Division, Department of Commerce, Washington 25.

### Filing with NPA Simplified

Instead of having to apply to some 12 or 15 NPA industry divisions for CMP steel plate allotments, as ap-

pears to be necessary from the listings in the CMP "B" products list, manufacturers of all types of boiler shop products now may file for all their steel requirements with a single NPA unit. This is the Heavy Metal Tanks Section, Engine and Turbine Division.

This section is granting allotments for plates for all such products as heavy steel tanks, pressure vessels, fabricated plate pipe, smokestacks,



breeching, pulp digesters, etc. This unit, incidentally, still is accepting applications for third quarter shipment even though May 31 originally had been set as the deadline.

## New Job for William Clay Ford

Youngest of the three Ford brothers, William Clay, has moved into a new spot in the Ford organization. Since joining the company in March, 1949, he has been getting a thorough indoctrination into what makes the company tick. Starting in the sales and advertising department, he was put on the company's negotiating team for its bout with the UAW that summer, and since then has been attached to other staff and operating departments. His new assignment is manager of the quality control department of the as yet unconstructed gas turbine plant of Lincoln-Mercury Division.

An aircraft accessories building will be put up by the Parts & Equipment Manufacturing Division of Ford on a newly acquired 3½ acre site adjacent to its headquarters plant in Ypsilanti, Mich. It will figure in the division's production of aircraft fuel injection systems.

## STEEL's Weekly Summary of Subcontract Opportunities

ANOTHER Armed Forces Subcontracting Exhibit will be held July 27 to August 3 at the Keil Municipal Auditorium in St. Louis. The exhibit is arranged for small businesses in Missouri, Iowa, Nebraska, Kansas and Illinois. It is added to others already set for Cleveland and Los Angeles (STEEL, July 2, p. 50) and gives potential suppliers a full schedule of opportunities to land the awards they seek.

As a result of contracts reported recently, a few more non-precision

GOVERNMENT control orders are digested or listed each week in this "Checklist on Controls." For complete copies of NPA orders, write to U. S. Commerce Department, Division of Printing Services, attention E. E. Vivian, Room 6225, Commerce Bldg., Washington 25. For ESA orders, write J. L. Miller, Economic Stabilization Agency, Room H367, Temporary E Bldg., Washington 25.

### Materials Orders

**COPPER**—Amendment of July 1, 1951, of NPA Order M-11 sharply increases the amounts of copper and copper-base alloy products that must be set aside in the third quarter of 1951 for filling of defense-rated orders.

**WOOD PULP**—NPA Order M-72, effective July 1, 1951, requires integrated mills to set aside 3 per cent of their chemical wood pulp for purchase by nonintegrated mills, restricts consumption of chemical wood pulp, and limits inventories.

**SOLE LEATHER**—Amendment of June 28, 1951, of NPA Order M-34 exempts small firms manufacturing shoes or cutting sole leather from restrictions on sole-leather cutting.

**PASSENGER AUTOS**—Amendment of

July 1, 1951, of NPA Order M-68 adds aluminum castings and forgings to the list of materials whose use is limited in automobile production. Actually the amendment does not change the amount of aluminum castings and forgings permitted in production of passenger cars. Prior to the amendment, manufacturers were subject to the 65 per cent base period usage limitation of NPA Order M-7 (aluminum).

**FARM EQUIPMENT**—Direction 1 to NPA Order M-55A says that materials procurement help under NPA Order M-55A for farm machinery makers is concluded as of the dates on which individual manufacturers receive their CMP authorizations. Direction 1 was issued June 28, 1951.

**COMPONENTS**—Direction 1 to NPA Order M-60 says that materials procurement help under NPA Order M-60 for manufacturers of components and related products is concluded as of the dates on which individual manufacturers receive their CMP authorizations. Direction 1 was issued June 28, 1951.

**MACHINE TOOLS**—Direction 1 to NPA Order M-61 says that materials procurement help under NPA Order M-61 for producers of machine tools is concluded as of the dates on which individual manufacturers receive their CMP authorizations. Direction 1 was issued June 28, 1951.

**NICKEL**—Amendment of June 29, 1951, of NPA Order M-14 extends this nickel conservation order for the third quarter of 1951.

**GRAPHITE, ELECTRODES**—Amendment of June 30, 1951, of NPA Order M-66 delays until Aug. 1, 1951, the third quarter allocation of artificial graphite and carbon electrodes. The delay was made necessary because of the amount of paper work required to establish allocation. Meanwhile, the industry will operate under M-66, with deliveries of artificial graphite and carbon electrodes being subject to the normal priority sequence except that defense-rated (DO) orders will have a status equal with rated orders bearing an allotment symbol.

**ALUMINUM** — Revocation of NPA Order M-7 (aluminum for civilian use) was effective July 1, 1951. Provisions of M-7 were incorporated in NPA Order M-47A to limit use in the third quarter, 1951, of aluminum in certain consumer durable goods and related products. Use of aluminum in most other items in the third quarter, 1951, will be regulated by issuance of Controlled Materials Plan allotments.

**RAILROAD MRO**—NPA Order M-73, issued June 28, 1951, and effective that date, provides a uniform procedure under which rail transportation systems may obtain their requirements for maintenance, repair and operating supplies, and minor capital additions. To achieve an equitable distribution of materials for MRO, NPA established a form, NPAF-105, on which quarterly requirements will be listed in advance.

### PRODUCT

Motor Scooters (3-wheel) .....  
Ambulances (¾-ton) .....  
Trucks—Earth Borer & Pole Setter .....  
Trucks—Pickup .....  
Trucks—Cargo .....  
Pumps .....

Pumps (diesel fuel oil transfer) .....

Electric Winches .....  
Automatic Tensioning Winch .....  
Electric Windlass, Anchor Assemblies .....  
Main Propulsion Turbines .....  
Power Units .....  
Motor Generator Sets .....

Power Plant Assemblies .....

Dynamotors .....  
Motors .....

Switchboards .....  
Signal Generators .....  
Radio Receivers, Transmitters .....  
Meter Assemblies .....  
Mobile Training Units .....

### CONTRACTOR

Cushman Motor Works Inc., Lincoln, Nebr.  
A. J. Miller Co., Bellefontaine, O.  
Highway Trailer Co., Edgerton, Wis.  
Fargo Motor Div., Chrysler Corp., Detroit  
Willys-Overland Motors Inc., Toledo, O.  
Aurora Pump Co., New York  
Wilson-Snyder Mfg. Div., Oil Well Supply Co., Braddock, Pa.  
Walter H. Eagen Co., Inc., Philadelphia  
Ingersoll-Rand Co., Phillipsburg, N. J.  
Leslie Co., Lyndhurst, N. Y.  
Skagit Steel & Iron Works, Sedro-Woolley, Wash.  
C. H. Wheeler Mfg. Co., Philadelphia  
Western Gear Works, Seattle  
Westinghouse Electric Corp., Pittsburgh  
D. W. Onan & Sons Inc., Minneapolis  
Continental Electric Co., Inc., Newark, N. J.  
Hertner Electric Co., Cleveland  
Crocker-Wheeler Div., Elliott Co., Ampere Station, N. J.  
Boque Electric Mfg. Co., Paterson, N. J.  
Vickers Electric Div., Vickers Inc., St. Lou's  
DuMont Aviation Co., Long Beach, Calif.  
Lycoming-Spencer Div., Avco Mfg. Corp., Williamsport, Pa.  
Wolverine Diesel Power Co., Detroit  
Radio Corp. of America, Camden, N. J.  
Marble-Card Electric Co., Gladstone, Mich.  
Serve Tek Products Co., Paterson, N. J.  
North Electric Mfg. Co., Galion, O.  
Measurements Corp., Boonton, N. J.  
Victor Div., Radio Corp. of America, Camden, N. J.  
Continental Electric Co., Newark, N. J.  
Republic Aviation Corp., Farmingdale, Long Island, N. Y.



**TIN CANS** — Amendment of July 1, 1951, of NPA Order M-25 establishes for the first time quotas and preference ratings on the use of cans made of black plate. The amendment was effective July 1.

**OIL AND GAS**—Supplement 1 to NPA Order M-46 sets forth regulations and instructions for the use of allotment numbers to procure controlled materials and fabricated items for operators in the petroleum and gas industries in the U. S. and Canada. M-46 had made priorities assistance available, and Supplement 1 assigns allotment numbers for use in connection with it. Supplement 1 was effective June 29, 1951.

**HIDES**—Amendment No. 1 to NPA Order M-62 extends until July 31, 1951, the NPA restrictions governing the processing of horsehides and certain other hides and skins. The amendment was issued June 29, 1951.

**TIN**—Amendment of July 1, 1951, of NPA Order M-8 makes these principal changes in regulations on pig tin: 1. All users are limited to a rate of 90 per cent of their usage of pig tin in the first six months of 1950. Heretofore they were allowed this rate, plus the amount required to produce implements of war. 2. Amount of pig tin that can be bought without an allocation is reduced from five long tons to 6000 pounds. 3. Inventory of lead base alloys that is permitted is reduced from 60 to 45 days. 4. Manufacturers of milk cans and tin plate are removed from the 90 per cent quota limitation, inasmuch as they are now programmed and may consume only that pig tin specifically authorized by NPA.

## NPA Regulation

**AID TO CANADA** — Amendment of June 29, 1951, of NPA Regulation 3 places Canadian producers covered by existing NPA orders and regulations under provisions of the Controlled Materials Plan on a basis comparable with U. S. manufacturers. The amendment was effective June 29.

## Price Regulations

**LEAD SCRAP**—Ceiling Price Regulation 53 issued by the Office of Price Stabilization June 29, 1951, and made effective that date, rolls back lead scrap ceiling prices to levels normally related to those for the primary metal. The regulation establishes dollars-and-cents ceilings for battery lead scrap and other lead scrap materials, secondary lead, and primary and secondary antimonial lead, as well as prices for brokerage services connected with sales of scrap battery lead plates.

**ALUMINUM**—Ceiling Price Regulation 54 issued by the Office of Price Stabilization June 29, 1951, and made effective that date, rolls back prices of secondary aluminum ingot and aluminum scrap to levels reflecting the value of metallic content in terms of current prices for primary aluminum. The new ceilings are 30 to 50 per cent below prevailing market figures.

**MILITARY EXEMPTIONS**—Amendment 2 of General Overriding Regulation 9 of the Office of Price Stabilization expands its list of military items exempt from all price control when sold under the defense program to include tactical trucks and trailers, tanks, self-propelled artillery, cargo tractors, amphibious cargo tractors, and armored infantry carriers. The amendment was effective June 27, 1951.

**MACHINE TOOLS** — Supplementary Regulation 2 to Ceiling Price Regulation 30 of the Office of Price Stabilization permits machine tool manufacturers, in determining ceiling prices, to include cost increases resulting from more use of overtime and shift premium labor and subcontracting. SR 2 was effective June 27, 1951.

**RETURNABLE CONTAINERS**—Supplementary Regulation 9 to Ceiling Price Regulation 22 of the Office of Price Stabilization permits manufacturers who sell products in returnable containers to adjust their ceiling prices to reflect the increased cost of such containers. SR 9 was effective July 2, 1951.

**COKE, CHEMICALS, GAS**—Amendment 2 of Supplementary Regulation 13 to the General Ceiling Price Regulation extends to midnight of Sept. 30, 1951, the expiration date of the Office of Price Stabilization ceiling price order covering producers of coke, coal chemicals and coke oven gas. Amendment 2 was issued June 29, 1951.

**POSTPONEMENTS** — Supplementary Regulation 12 to Ceiling Price Regulation 22, and Supplementary Regulation 3 to Ceiling Price Regulation 30 postpone indefinitely the effective dates for placing some specific commodities under CPR 22 and CPR 30. Affected under CPR 22 are numerous commodities but especially metal and plastic products, petroleum derivatives and printing products. The extension under CPR 30 applies only to insulated electrical wire and cable and fabricated structural shapes, plates and related products. The commodities for which extensions are authorized will be placed shortly under new specially designed regulations or handled under supplementary pricing provisions. In the interim, affected manufacturers will continue, if they so elect, to determine ceilings under the General Ceiling Price Regulation. Effective date of CPR 22 and CPR 30 was July 2.

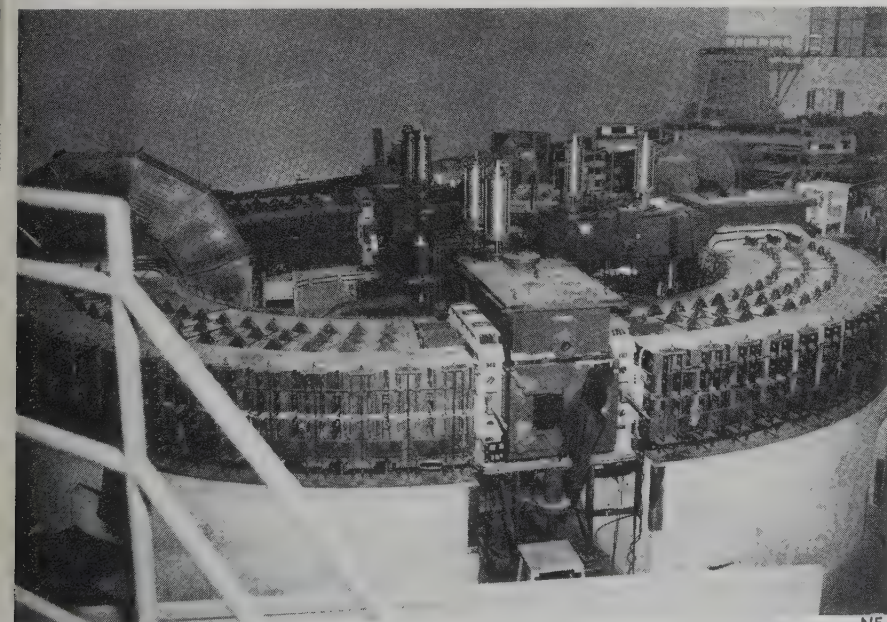
**PRICES FROZEN**—General Overriding Regulation 13 issued June 30, 1951, and made effective July 1, 1951, by the Office of Price Stabilization froze June 30, 1951, prices of manufacturers covered by the general manufacturers' order (CPR 22) and companion manufacturers' regulations. Filing provisions of these regulations are extended indefinitely. Most of these regulations were to have become effective July 2, 1951, and would have established new ceiling prices based upon pre-Korean levels, plus certain cost increases since then. Price rollbacks were prohibited by the 31-day extension by Congress of the Defense Production Act of 1950.

## NPA Delegations

**CMP ALLOTMENTS**—Amendment of June 30, 1951, of NPA Delegation 1 authorizes the secretary of defense and his designees to make allotments of controlled materials and to apply and assign the right to apply defense ratings and allotment numbers and symbols to meet authorized programs for which the Department of Defense is claimant agency. Delegation 1 already authorized the secretary of defense to assign defense order (DO) ratings in connection with its authorized programs. The new amendment extends the authority to include allotment of controlled materials.

**OIL AND GAS**—Supplement 1 to NPA Delegation 13 authorizes the Petroleum Administration for Defense to reschedule deliveries of controlled materials for the petroleum and gas industries. Thus, materials can be diverted from one oil company which may not be ready for them to another company which is urgently in need of them. The authority applies only to delivery schedules, not to production. Supplement 1 was effective June 30, 1951.

**CONSTRUCTION**—Amendment of July 2, 1951, of NPA Delegation 7 adds 20 field offices to the list of those authorized to act on construction applications under NPA Order M-4.



**FACT FINDER:** More information about the atom will be provided by this huge synchrotron, being built at California Institute of Technology, Pasadena, Calif., under contract with the Atomic Energy Commission



# Windows of Washington

By E. C. KREUTZBERG Washington Editor

**Look for a Small Defense Plants Corp. to be set up as a government agency. Its assistance would be available to substantially all of American business**

A SMALL DEFENSE Plants Administration is one step nearer reality.

Creation of such an agency was favored by the Senate when it approved the Sparkman amendment in voting to extend the Defense Production Act.

Action on the Sparkman amendment remains to be taken by the House, but it is expected to be favorable inasmuch as its terms have been approved by the House Banking and Currency Committee.

The Small Defense Plants Administration would be similar to the Smaller War Plants Corp. of World War II.

The new agency would encourage small business participation in defense and defense-support programs by means of government loans, technical and managerial assistance. It would have power to book prime contracts and subcontract them to small firms. It would confer with the Defense and other departments on procurement planning with a view to diverting a satisfactory percentage of all procurement to small business. It would make a complete inventory of the productive facilities of small business, and would create an industry advisory committee, composed of small businessmen, for the purposes of consultation. It also would be charged with the task of obtaining for small business a fair share of the available strategic materials.

The administration would be headed by an administrator responsible only to the President, would have its headquarters in Washington and would have branch offices in important cities.

The proposed corporation would be available to substantially all of American business, since it has come to be generally assumed in Congress and the government that all but some 100 to 200 "giant corporations" are small business firms.

## Less Hush-Hush . . .

The Defense Department's liberalized policy in regard to releasing procurement information is beginning to be reflected in the Commerce Department's daily Consolidated Synopsis of United States Government Procurement Information. All military

procurement offices, instead of only the 55 major ones as before, now are reporting. In addition, the rule calling for an interval of 18 days between publication of the bid information in the synopses and closing the contract is being observed in all but the few cases in which immediate action is needed. Notices of the intent to negotiate specific contracts are beginning to appear in the synopses. And approximate dollar values of contracts are being reported so as to give small firms some idea as to where to seek subcontracts.

The department continues to study the matter and may soon be giving out information about procurements now identified as restricted.

## Searching for Substitutes . . .

A Subcommittee on Critical Alloy Substitutes has been appointed by Howard Coonley, chairman of DPA's Conservation Co-ordinating Commit-

tee, with the object of easing the pressure on alloying metals.

Membership of the subcommittee: Chairman, E. L. Bearman, United States Navy; James T. Kemp, Department of Interior, and former American Brass Co. metallurgist; Lieut. Col. J. P. Woodlock, United States Air Force; Lieut. Ralph W. Preston, United States Army; Dr. Richard Cole, Munitions Board; E. Hergenroether, assistant director in charge of metallurgy and conservation, Iron and Steel Division, National Production Authority; and John G. Wood, Defense Production Administration, and retired chief engineer, Chevrolet Division of General Motors.

## Scrap Imports Favored . . .

Following emergency action by congress, President Truman signed into law an act further suspending duties and import taxes on metal scrap to June 30, 1952. The measure was necessary because demand for both ferrous and nonferrous scrap exceeds supply and makes suspension of duties essential to continued imports, says Rep. Herman P. Eberharter (Dem., Pa.).



**UNIVAC UNVEILING:** This advanced electronic calculating system—Remington Rand's new universal automatic computer—is delivered by the National Bureau of Standards to the Census Bureau in Philadelphia. Present at the presentation, left to right: James H. Rand, Remington Rand president; Dr. Roy V. Peel, Census Bureau director; Lt. Gen. Leslie R. Groves, Remington Rand vice president; Charles Sawyer, Secretary of Commerce; Dr. Edward U. Condon, director of the National Bureau of Standards; and Albert Greenfield, president of Philadelphia's Chamber of Commerce. Seated is Prof. J. Presper Eckert of Remington Rand, co-inventor of the Univac



# Europe's Import Bill Rises by \$3 Billion

**Inflation remains a major problem even though West European nations are producing 35 per cent above prewar and have already hit the 1952 production target**

**THIS YEAR**, Europe will have to pay about \$3 billion more to obtain even the same volume of imports as in 1950. Even more will have to be paid if inflation continues.

Inflation remains a major problem in Europe, as in the U.S., despite phenomenal industrial progress since the end of World War II.

**Up and Up** — Between 1947 and 1950, industrial production in Western Europe increased by 45 per cent, to a level 25 per cent above the prewar average, according to a report of the Organization for European Economic Co-operation. During the second half of 1950, output was running at an annual rate some 30 to 35 per cent above prewar, thus hitting the target first set for 1952.

The gains in production made possible an increase of \$6.7 billion in exports from 1947 to 1950. Imports increased by only \$2.3 billion, and the over-all deficit shrank from \$8 billion in 1947 to \$1 billion last year. The dollar gap narrowed by a similar amount, but inflation is reversing the trend.

**A Jingle in Their Jeans**—The gross national product increase between 1947 and 1950 among OEEC nations was an estimated \$31 billion, at 1949 prices. After allowance of about \$2 billion for unfavorable terms of trade, the OEEC estimates that the remaining \$29 billion was used this way: \$7 billion to reduce the external deficit, \$5 billion to raise the level of gross national investment, \$1 billion for increased government expenditures and \$16 billion to increase personal consumption.

Besides inflation, OEEC sees these as the major problems facing Western European Nations: Defense expenditures which last year absorbed 33 per cent of government budgets and this year will take even more; shortages of raw materials; insufficiently rapid gains in productivity so that more output can be devoted to defense with a minimum effect on civilian life.

## U.K. Expands Steel Controls

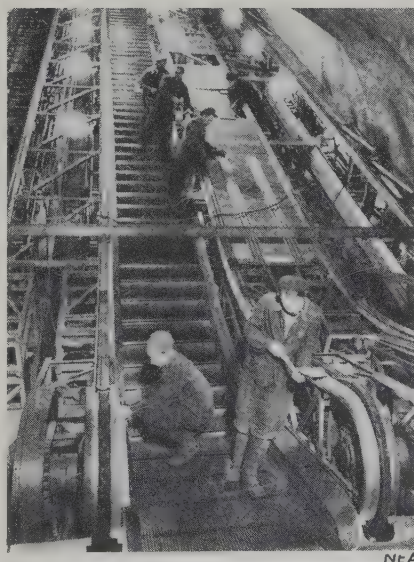
The British government has introduced a voluntary system of controls on iron and steel products (except on sheets and tin plate which are already subject to allocation) that will be in effect until about the end of the year when a more formal system

will be readied and put in use.

The program is similar to the U. S. system before the Controlled Materials Plan went into effect July 1. Although in Britain the plan is ostensibly "voluntary," it has the effect of being mandatory since most iron and steel production facilities are owned by the government. British companies working on armament orders will be given a Defense Order symbol to get their steel. The DO scheme will be administered by the ministries of Supply and the Admiralty.

The program also includes PT (Preferential Treatment) symbols to be awarded makers of essential civilian products to help them get steel. The PT awards will be limited to 6 or 7 per cent of the total steel available. DO awards take more. Direct and indirect iron and steel exports will not be tightened any further than they are now.

Minister of Supply G. R. Strauss, in connection with controls, wants to move in on the British Iron & Steel Federation, a non-government organization that still controls British Iron & Steel Corp. Ltd. and British Iron & Steel Corp. (Ore) Ltd. which are in charge of purchasing and supplying raw materials for the steel in-



**FOR RED RIDERS:** A new addition to the subway system of Moscow is this modern escalator at the Botanicheskaya station. The Russian capital boasts an excellent subway system. It is built on a circular plan and will cover virtually every part of the city when completed

dustry, in co-operation with the new state-owned Iron & Steel Corp. of Great Britain. The government wants more voice in the activities of the federation.

## German Steel Curbs Necessary

The West German government at Bonn is working out a controls program for the German steel industry.

The step is necessitated because most iron and steel plants are sold out for 12 to 15 months in advance. Civilian iron and steel consumers must reckon with a reduction of their allocations by an average of 25 per cent. Complicating the problem is reduced production of coal, and consequently coke. During this third quarter, coal and coke allocations will be cut 15 to 18 per cent.

The steel industry is further hampered by inadequate ore supplies. Lack of shipping has cut imports. Ruhr furnaces got some 385,000 tons of ore from Sweden in January, but those shipments are down to about 170,000 tons a month now.

## France May Surpass 1929 Peak

The French in 1951 may surpass the 1929 steel ingot production record of 10.6 million net tons—if they can get enough scrap and coke. Enough iron ore is assured.

First half ingot output was nearly 5 million tons, but that was achieved with coke imported from the U. S. and Germany. Now, a coke shortage of about 250,000 tons threatens. U. S. shipments are falling off, and the Germans want to limit sales of their coke to the French.

Although sufficient ore is available, it has gone up in price; Lorraine ore is now \$2.17 per metric ton compared with the former price of \$1.88.

## Belgian Economy Rides High

The Belgian economy is riding high. Industrial production index is now at about 125 per cent (1936-1938=100), and steel and machinery exports are excellent.

About 440,000 net tons of Belgian steel are going to other countries monthly, mainly the Netherlands. Export prices are terrific; a quotation of \$170 per metric ton has ruled some transactions on plates. Average Belgian export prices range from \$144 to \$150 per metric ton.

So great has been the pressure for steel exports that the government has had to step in to assure adequate steel for the domestic market. Producers have agreed to guarantee to the home consumers a minimum of 198,000 tons a month.



# Osborn Story: Brushing Up on Business

**Manufacturer of industrial brushes finds the way to boost sales: Product engineering to sell brushing first and Osborn products second**

A LITTLE MORE than a decade ago, Osborn Mfg. Co. felt like someone trying to go up on a "down" escalator.

Its power-driven brush business (the company also makes paint brushes, maintenance brushes and foundry moulding machines) was progressing steadily but slowly. The power brush was being increasingly accepted as an essential industrial tool, but there was still a long way to go.

**Soul Searching**—Executives of the Cleveland company did a lot of re-considering in that period and came up with decisions that have helped it become the largest maker of power brushes in the world today. Keystone in the new policy was the decision to sell brushing first and Osborn brushes second. That meant establishment of an application engineering department to show potential customers, particularly in the metal-working industry, what brushing can do.

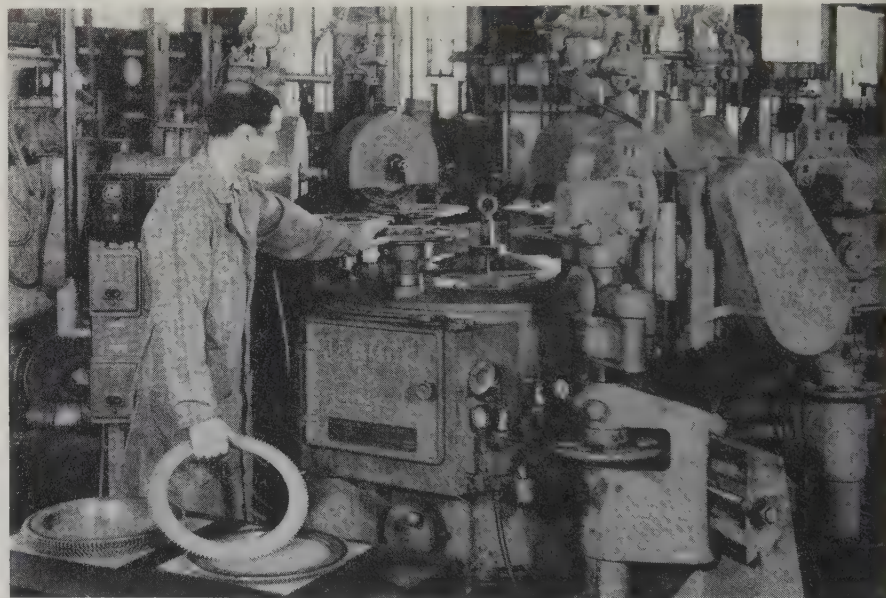
In setting up its engineering department, Osborn realized that it didn't fully know what power brushing can do. R. O. Peterson, manager of the technical department, points out that his men are still learning the ramifications of brushing. He and V. K. Charvat, assistant manager, have this advice for any company starting an application engineering section: Never pose as an expert; start small; and let the program evolve naturally.

**Genesis**—Osborn started small by working on only those application jobs coming up in customer inquiries. Although there are a lot more of them now, those jobs still account for 80 per cent of the engineering department's activities. The company calls that its reactional approach. Its positive or volitional approach accounts for 20 per cent of the work. The goal now is to transpose those percentages.

The reactional approach usually involves a small, one-shot proposition. The volitional are bigger jobs that may have wide applications in many companies. The fully volitional application is dreamed up by Osborn engineers themselves. The semi-volitional usually results from customer inquiries or tips from salesmen and is more co-operative than reactional.

**The Proof of the Pudding**—A volitional job just beginning to bear fruit is deburring. Osborn found that many

companies were—and still are—removing burrs by laborious hand methods. The engineering department went to work, developed a brush to do the job and designed machinery to operate and to apply properly the power driven brush. First, the idea was sold to one prospect with the object of making any final adjustment or modifications that would be necessary to develop finally the brushing method as a practical factory operation. In the case of gear deburring, that first prospect found that his gear deburring rate went from twenty per man hour to one hundred and eighty per man hour. Another example is a company that had been using a hand method. To assure sufficient produc-



**APPLICATION ENGINEERED: CLUTCH DISK GETS AUTOMATIC BRUSHING**  
... output boosted 200 per cent over former hand method

tion, 15 people—five per shift—had used a hard hand tool to deburr two hundred clutch discs an hour. With power brushing in the plant, three unskilled workers—one per shift—can now turn out six hundred discs per hour. When the job is fully proved, Osborn applies the principles involved to other jobs of similar nature.

In that and all other jobs, Osborn first makes practical tests to find what brushes will do the task. It starts first with its standard power brushes. If none of those work, it tries various modifications of the standard units. If that fails in tests, it begins experimenting with brushes

made from new materials or with designs in brushes that use standard materials. Given sufficient time, it usually comes up with a solution.

**Power**—Next, the application engineers may have to suggest or design the machinery to power the brush. That has proved a knotty problem over the years, one which has evolved over the department along a line not originally foreseen. Few machinery builders specialize in brush-using machinery, so Osborn has had to devote some of its application engineering energies to such development. It may design a machine for a job, but tries to get an outside builder to design and make it first. Failing in that, the Osborn company has occasionally built the machine itself. On highly specialized applications, present-day standard equipment can occasionally be satisfactorily adapted for brushing operations. When an outside builder accepts the job, Osborn's only concern is that the builder follow its or satisfactory specifications.

The third phase of application engineering is the actual application done while the first two phases are also going on. Although most of the brush and machinery development goes on at the Osborn laboratories, the practical way to do much of the physical application work is at the plant of the customer.

**Men at Work**—About 45 people do the brush company's application engineering—one third in testing, one third in machinery design and development and one third in the actual application task. The application man writes a detailed report of the job, including a complete layout for the customer on precisely where the ma-



inery will be placed and the production per hour.

For every job, the engineers ask themselves these questions:

1. What is to be accomplished:
  - a. Clean or remove—what material?
  - b. Roughen or smooth — what kind of surface?
  - c. Finish or polish—to what degree?
  - d. Round corners or blend surfaces—how much?
2. What kind of equipment is needed?
  - a. Brushing lathe—what horsepower and speed?
  - b. Automatic brushing machine—what type?
  - c. Portable or flexible - shaft equipment?
3. What are the properties of the material involved, especially hardness?

4. At what rate and under what conditions must the work be done?

If answers to those questions indicate a technique other than brushing is best, that is reported.

**Specialization** — For practicality, Osborn finds that its application men must specialize in specific jobs or fields. One man may be the specialist in deburring and centerless finishing. Another man gets all the polishing and buffing jobs. All steel mill-type applications go to another. Two sales trainees learning the business handle routine queries, such as how to brush eggs, put the beads on balloons or clean and polish pecan nuts.

In the more than ten years Osborn has been doing application engineering, it has found that the trick is to stick with the job and have patience. It often takes from nine months to a year between the time a job starts and the time it bears fruit. Occasionally, a project doesn't pan out even after considerable time has been spent on it. However, if a brushing operation is built on sound principles, which with brushes can usually be established easily with simple off-hand tests and with relatively simple set-ups, a successful and efficient operation is practically a matter of course.

**Personnel**—One problem not yet completely solved by Osborn is the matter of men. For which jobs should it hire young engineering graduates and train them completely itself? For which jobs should it hire technical men already established in industries where it wants to develop applications and teach them the fundamentals of brushing? Osborn uses both methods of recruiting personnel.

Has the application engineering program worked? In about ten years, Osborn has handled more than 5000



**TESTING HARDNESS OF WIRE FILL**  
... helps find right brush for job

application jobs. It's now equipped to do 300 at a time. Some 50 to 100 technical reports are written a month. A successful project handled almost a decade ago now means \$50,000 a year to Osborn in brush sales. Most others result in less business than this and a few in more.

## U.S. To Study German Research

What are the Germans doing in the field of industrial research? Can we derive values from copying their technique and approach?

These questions will be answered this summer when a team representing four leading United States research institutions will go to Germany; they are Battelle Memorial Institute, Columbus, O., Armour Research Foundation, Chicago, Southwest Research Institute, San Antonio, Tex., and Stanford Research Institute, Stanford, Calif.

The trip will be under sponsorship of the Economic Co-operation Administration and at the invitation of the west German government which is eager to get recommendations from the Americans as to how German industrial research may be improved.

## Shortage of Engineers Threatens

Some 80,000 engineers are now needed exclusive of military demands, says the Engineering Manpower Commission of Engineers' Joint Council on the basis of a June, 1951, survey of the requirements of 378 companies and government agencies.

When the current graduating class of 38,000 is absorbed, there is still an unfilled demand for 42,000 engi-

neering graduates. But in the 1951 class of engineering graduates, the military through R. O. T. C., reserve programs and the Selective Service system will siphon off about 19,000 graduates. The actual unfilled demand will then be for more than 60,000 engineers.

The manpower commission concludes that the need for engineers cannot be met through the current sources of supply. The 1952 graduating class will be only about 26,000; 1953, 17,000; 1954, 12,000.

The development of atomic energy, antibiotics, jet propulsion and electronics has boosted the ratio of engineers to the working force. The ratio now stands at about 1600 engineers per 100,000 workers.

## Research Improves Well Casing

A tougher, stronger steel casing has been developed by research men of National Tube Co. to withstand the tremendous pressure of today's deep oil wells. The casing is now being produced on newly installed equipment at the McKeesport, Pa., facilities of the U. S. Steel subsidiary.

Holes more than 20,000 feet deep are an accomplished fact, and a substantial oil drilling program at depths over 12,000 feet can be expected. To find a casing that would hold up under pressure of deep wells, National Tube started a research program. A quenched and drawn carbon-manganese steel was developed that, in seven-inch outer diameter casing, has a 110,000 pounds a square inch minimum yield strength at 0.6 per cent total strain, 139,000 pounds a square inch average ultimate strength and 22.4 per cent average elongation in two inches.

## Cheaper Titanium Claimed

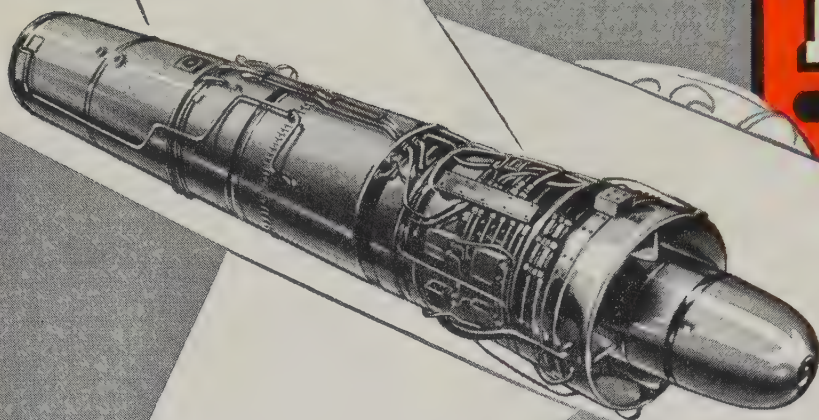
Horizons Inc., Princeton, N. J., and Ferro Inc., Cleveland, have formed Horizons Titanium Corp. to produce titanium by a newly developed process claimed to be cheaper than present methods. The new company will build a pilot plant in Cleveland to carry further the experiments done before in Horizons' laboratories.

## Two Join in Titanium Research

Monsanto Chemical Co., St. Louis, and National Research Corp., Cambridge, Mass., have started a joint research venture to develop improved processes for the production of titanium. Work initiated by National Research will be expanded under terms of the agreement and additional activities will be carried on at Monsanto's Dayton, O., facilities.



*Another First for...*



The use of N-A-X ALLOY STEEL in Aircraft Gas Turbines saves up to 50 per cent of critical Stainless Steel.

### **Conservation is possible — without sacrifice with use of N-A-X ALLOY STEELS**

With the demand for greatly increased quantities of the critical and strategic Stainless Steels used in Jet Engines intensified by the acceleration of the building program, the Air Force requested the producers of these engines to seek suitable material with less critical alloy content to replace the Stainless Steel for certain moderate temperature application in these aircraft gas turbines.

The steel selected had to be of low-alloy content with high strength and good welding characteristics. Ordinary low carbon steel did not meet the requirements because of its low tensile properties and the fact that it could not be satisfactorily welded by the inert arc process, which is widely used in aircraft gas turbine manufacture.

The data available from tests made on several weldable low-alloy, high-strength steels indicated that N-A-X ALLOY STEEL was the most satisfactory of the group — *its selection followed*. Unlike other possible substitutes, N-A-X ALLOY STEEL has good low temperature impact values, maintains its higher strength and is not subject to temper brittleness in the wide operating temperature range required of the steel for this purpose — from a low of  $-70^{\circ}\text{F}$ . to  $+800^{\circ}\text{F}$ .

The use of N-A-X ALLOY STEEL for this application has cut the amount of Stainless Steel required in half. This is of considerable importance to the Air Force.

### **GREAT LAKES STEEL CORPORATION**

N-A-X Alloy Division

Ecorse, Detroit 29, Michigan

**NATIONAL STEEL CORPORATION**





## Threat of unemployment in automotive plants is behind Reuther's scheme to speed machine tool output and thus hasten the transition to more war work in Detroit

### DETROIT

THE MACHINE tool industry is the most serious bottleneck in our defense production." So states Walter Reuther, UAW-CIO president, who has a "Reuther Plan" aimed at eliminating the chokepoint.

It proposes the formation of a separate division within NPA to co-ordinate the program, which involves establishment of central machine tool assembly plants under government control, those plants being fed with parts and subassemblies coming out of privately-owned foundries, forge shops, tool and die and other machining facilities which may be only partially in use at present.

**Hasten the Change**—The assembly line technique adapted to machine tools, Mr. Reuther believes, can cut the delivery time lag by as much as 50 to 75 per cent. The quicker such tools can be delivered, the less transitional unemployment will be generated by the switch from civilian to defense work, he believes.

As much discussion may be stimulated by this proposal as was aroused by previous Reuther plans. He suggested in 1940 that automobile plants be converted into aircraft assembly facilities. Early in the last war he proposed methods for speeding up war production, and he fastened on the idea of greater standardization and interchangeability of tank engines. Postwar, he was preoccupied with the potentialities of aircraft plants for prefabricated house and freight car manufacture.

**Well-Timed** — The latest proposal will get close Washington attention. The day it was laid on President Truman's desk couldn't have been better chosen. Anguished protests on Capitol Hill and from the motor capital over the restrictive effects of government edicts on auto production and employment (see below) were creating a stir, which ultimately will lead to a review of the whole defense effort.

Automotive management, as well as labor, is concerned about machine tools. One management move to do something about machine tools has already been taken by Fisher Body Division of General Motors Corp. Fisher Body will build vertical turret lathes

### Auto, Truck Output

U. S. and Canada

	1951	1950
January	645,688	609,878
February	658,918	505,593
March	802,737	610,680
April	680,216	585,705
May	696,039	732,161
June	659,000*	897,853
July		746,801
August		842,335
September		760,847
October		796,010
November		633,874
December		671,622

Week Ended	1951	1950
June 16	157,026	204,704
June 23	158,909	205,334
June 30	157,436	197,767
July 7	107,000*	142,548

Sources: Automobile Manufacturers Association, Ward's Automotive Reports. \*Preliminary.

and horizontal boring mills, to take some of the load off regular builders.

### New Senator Investigates

Stirred by the outcry from labor and industry groups against the wave of layoffs threatening the automotive industry this quarter, the New Deal-minded senator from Michigan, Blair Moody, asked for an investigation into government policies with respect to steel allocation. The ex-Washington correspondent of a Detroit newspaper who was appointed to the late Arthur Vandenberg's seat, was named on Monday to head a special subcommittee in the Senate Small Business Committee to check into the situation.

Hearings by Moody's committee will begin in Detroit, probably this week, with Henry Ford II and Walter Reuther to be among the early witnesses. Other Michigan cities may be visited. Sessions in Pittsburgh and Washington are also planned.

Senator Moody in mapping out his committee's line of investigation indicated that they would delve into whether steel is being put away for defense work long before it is actually needed, and whether the defense-supporting programs are getting an un-

warrantedly good break in steel allocation.

Furthermore, the senator is interested in complaints that government-required red tape and paper work may be hog-tying manufacturers. "At no time," said the senator, "will this committee champion civilian production or civilian supply of materials against any necessary allocation of material for military production." But he will want to know that military needs are justified.

### Unemployment in Detroit?

There is no unanimity in Detroit as to how much unemployment will be caused by the restrictive order on automobile production. The most optimistic forecast is that handed down by the Michigan employment security commission, which believes that only 34,000 will be idle in the Detroit area. The Detroit Board of Commerce estimates 74,000 will be jobless by fall. Less authoritative bodies have set the unemployment total higher than 100,000.

Pessimism over Detroit's conversion problems was touched off, initially, by a Chrysler announcement that it was cutting its work force about 15 per cent, a total of 20,000, of which about 18,500 would be in the Detroit area. Briggs Mfg. Co., as chief body supplier to the corporation, will drop about 8800 employees from its rolls. Other automotive companies are skirting the problem by shutting down for limited periods. Nash takes the first two weeks of July for vacation. Studebaker was also idle last week, resuming today. Several others shut down for a long weekend, starting back to work on July 5.

In all the commotion, it was little noticed that the multitude of supplier organizations are also facing a critical period. And retail and other business establishments in Detroit were laying off a few here and there or failing to hire replacements because of the uncertainties of the next several months.

### Question of Auto Output

One of the things certain to be pointed out to Senator Moody's committee when it gets to Detroit is the improbability of passenger car production reaching the 1.2 million figure indirectly established by NPA for the quarter under M-68.

By NPA's own reckoning the "free"



supply of steel (i.e. that not earmarked for defense and defense-support programs) in the quarter will be less than 3.4 million tons. Of this, assuming the passenger car industry can get all it's entitled to and in sufficient balance, more than 60 per cent would be consumed in making the projected number of cars. A slice of this magnitude from the pool of finished steel reserved for non-preferential consumers cannot be taken by the auto industry without causing a lot of outcry from other would-be consumers.

The handwriting on the wall is beginning to be painfully clear to automakers. It spells out... No drastic changes in body and engine design. One of the writers is defense mobilizer Charles E. Wilson, who recently (STEEL, July 2, p. 49) put it this way "... Industry should scrap the idea of new seasonal changes in automobiles... or other nondefense items whose 1951 design is plenty good enough." This remark puts an onus on some companies who are too far along in their programs to shelve them completely, and on some who because of public apathy to the present product feel compelled to improve it. The government, which earlier gave its assurance that 1952 model changes would be allowed, has had to backtrack because of the unexpected urgency of machine tool and die tooling needs for defense.

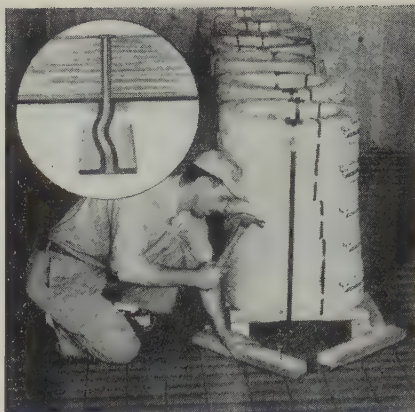
## Worse in Canada

In Canada, the automotive industry is in much worse shape, employment and saleswise, than is this country's. The complaints are basically the same — materials shortages and too-tight control of credit. There, however, laid-off autoworkers are getting very little encouragement that an answer can be found. C. D. Howe, defense minister, advises that they should move away from automotive centers to cities which offer other employment. Defense orders have been placed with only two car producers, both developmental contracts.

## Michigan Offers Help

To help Michigan plants participate more easily as defense order subcontractors is the purpose of a survey of facilities being carried out by the state's Department of Economic Development.

Questionnaires were sent to 3600 companies which employ more than eight people. Chambers of commerce are contacting the smaller shops to get maximum coverage in the survey. Listed on punch cards for

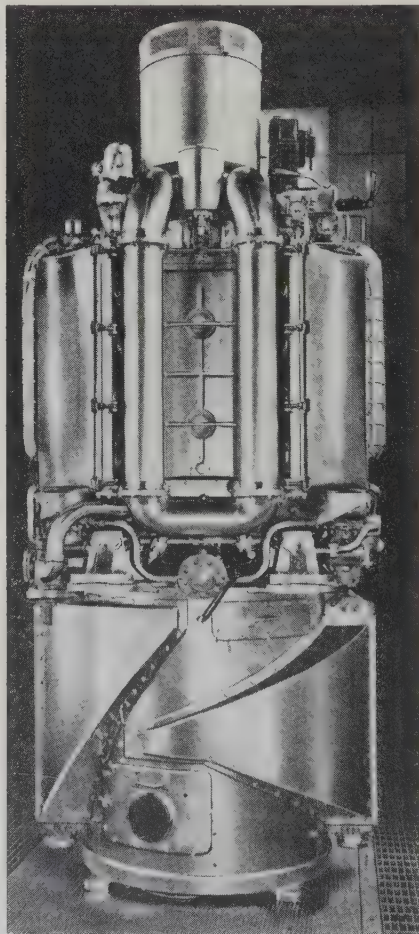


**FRUEHAUF'S NEW TRAILER FLOOR**  
... permits 500-pound weight saving

quick sorting are the equipment which each shop possesses and the products it can make.

## New Diesel Unveiled

Cleveland Diesel Engine Division of General Motors has revealed, in part, what is going on in its development program in co-operation with the Navy Bureau of Ships (STEEL, Feb. 12, p. 58). The product of five years' work and \$10 million expenditure was unveiled when a radical new sub-



**GM'S NEW DIESEL FOR SUBS**  
... has high power-to-weight ratio

marine diesel was turned over to the Navy. Four of the 16-cylinder engines have been installed in "attack" subs, George W. Codrington, GM vice president and general manager of the division, revealed.

Although the horsepower of the new engine is not disclosed, its per-pound production is twice as great as submarine engines used in World War II. Deputy Chief of Buships, Rear Admiral Leggett, said the new engine will give American subs "superior characteristics to any submarine in the world today," and because of the engine's compactness and high power to weight ratio, submarines so equipped will be able to carry a larger load of torpedoes, electronic equipment and fuel.

## Fruehauf Redesigns Floor

A new model all-steel van has been placed in production by Fruehauf Trailer Co. Designated FDL, the trailer features a nailable steel floor which permits a 500-pound weight saving over a similar design with conventional wood floor.

Using high tensile steel for the entire framework, the van employs corrugated steel sides, steel front and a galvanized steel roof assembly. The light weight nailable floor consists of easily replaceable sections with grooves in which a distinct curve in the male and female channel sides clamps a tight hold on nails driven into the channel. Holding power of nails hammered through cargo retainers and into the floor is said to be greater than in wood.

The unit is being produced in closed dry-freight and open-top van types, is built in 20 to 35 ft lengths with capacities of 20,000 and 25,000 lb in the single axle model, or 18,000 lb per axle with tandem axles.

## May Auto Exports Soar

May exports of motor vehicles by American producers were at the highest monthly level since 1937 and were nearly double what they were in the same month a year ago, Automobile Manufacturers Association reports. Accounting for 7.4 per cent of total U.S. factory sales, exports totaled 48,306 units.

## GM Model Contest Under Way

A display which gives a clue as to what Young America thinks automobiles ought to look like is in progress at General Motors' Detroit headquarters. The Fisher Body Craftsman's Guild, which sponsors the model-building contest, began filling showcases with the entries last week.



# The Business Trend

## Defense program won't be scrapped if fighting ends in Korea but pressure on civilian economy may be eased by allowing more time for the arms job

CEASE-FIRE in Korea won't take the U. S. economy off its semi-war footing. But the jackpot question is: To what degree will the government push its preparedness program after the hot war simmers down?

Between political and economic considerations, there are many possibilities. Under an armed truce, there might be a lessening of the urgency for turning out military goods, though the defense program will by no means be tossed in the nearest waste basket. The big gush of materiel, expected in mid-1952 might be pushed back into 1953, and a temporary lifeline thrown to floundering civilian goods industries. Taxes and controls, now being sniped at by a Congress reluctant to enact unpopular measures before fall elections, could be subjected to radical modifications. The federal budget will undergo closer scrutiny, particularly when the size of the 1951 fiscal year surplus is considered. Wage, price and production controls will be in the Washington limelight for a longer period than now antici-

pated. But the underlying business current will be much the same: Inexorable diversion of materials into plants producing armaments, tight reign over inflationary factors, continued grand-scale defense spending.

At present there's no sign of foot-dragging on a weekly output basis. STEEL's industrial activity index, for the week ended June 30, matched the mark of the preceding week at 220 per cent of the 1936-1939 average.

There will be no summer hiatus for industry this year, though many consumer lines are being forced to the idea of group vacations and extra layoffs. Normal vacation schedules and such time-outs as last week's observance of Independence Day should prevent setting of any new overall-activity records for the rest of this month and next but the normal summer lull will be hard to find.

### Steel Operations Drop ...

Another week of above-capacity operations was forecast for the steel

industry in spite of the holiday. American Iron & Steel Institute reported the week ended July 7 should see output of 2,015,000 net tons of ingots and steel for castings, contrasted with 2,055,000 tons the week before.

### Holiday Cuts Auto Output ...

Lower production rates face the automobile industry for the rest of this year but output in the past few weeks is a poor example of what to expect. *Ward's Automotive Reports* estimated output from U. S. and Canadian plants to amount to 157,436 passenger cars and trucks in the week ended June 30. In the previous week 158,909 were assembled; a year ago, turnout was 196,767. Last Wednesday's holiday coupled with such factors as labor, materials and, in some cases, sales difficulties will drop assembly totals considerably and get July off to a poor start. *Ward's* doubts July's first week saw 120,000 units assembled in U. S. plants.

### Coal Miners' Vacation ...

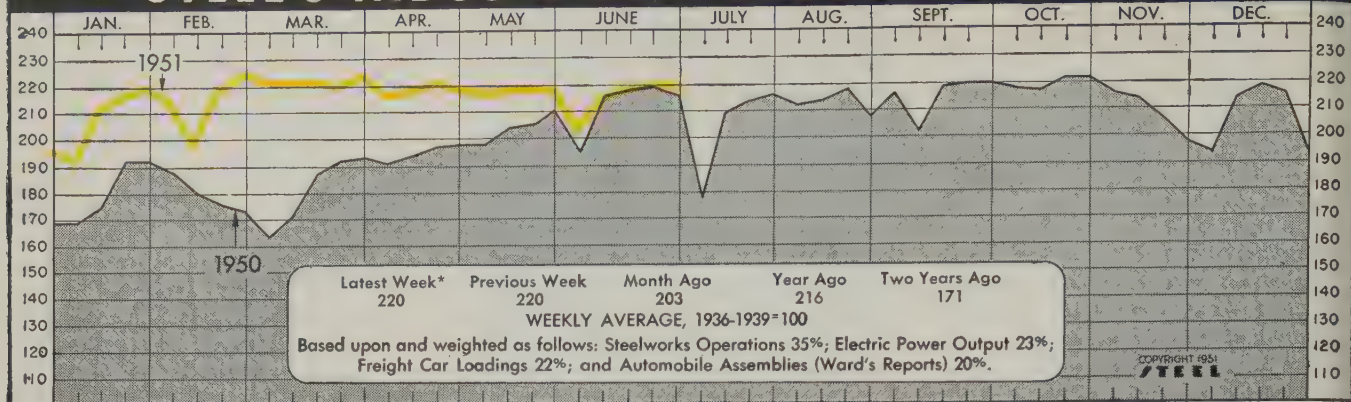
Fuel stockpiling by all types of consumers during the next 90 days is being urged by Defense Mobilizer Wilson—and that program should get a resounding second from coal

## BAROMETERS of BUSINESS

	LATEST PERIOD*	PRIOR WEEK	MONTH AGO	YEAR AGO
<b>INDUSTRY</b>	Steel Ingot Output (per cent of capacity)†	103.0	103.0	101.0
	Electric Power Distributed (million kilowatt hours)	6,840	6,835	6,115
	Bituminous Coal Production (daily av.—1000 tons)	1,838	1,717	1,758
	Petroleum Production (daily av.—1000 bbl)	6,190	6,192	5,435
	Construction Volume (ENR—Unit \$1,000,000)	\$316.7	\$207.4	\$287.6
	Automobile and Truck Output (Ward's—number units)	157,436	158,909	196,767
*Dates on request. †Weekly capacities, net tons: 1951, 1,999,035; 1st half 1950, 1,906,268; 2nd half 1950, 1,928,721.				
<b>TRADE</b>	Freight Car Loadings (unit—1000 cars)	825†	833	745
	Business Failures (Dun & Bradstreet, number)	170	180	156
	Currency in Circulation (in millions of dollars)‡	\$27,601	\$27,479	\$27,461
	Department Store Sales (changes from like wk. a yr. ago)‡	+6%	+1%	+3%
‡Preliminary. †Federal Reserve Board.				
<b>FINANCE</b>	Bank Clearings (Dun & Bradstreet—millions)	\$16,593	\$17,830	\$11,959
	Federal Gross Debt (billions)	\$254.4	\$254.4	\$255.0
	Bond Volume, NYSE (millions)	\$14.4	\$11.8	\$10.3
	Stocks Sales, NYSE (thousands of shares)	8,724	5,711	4,630
	Loans and Investments (billions)†	\$70.4	\$69.5	\$69.5
	United States Gov't. Obligations Held (millions)†	\$31,186	\$30,555	\$30,382
†Member banks, Federal Reserve System.				
<b>PRICES</b>	STEEL'S Weighted Finished Steel Price Index††	171.92	171.92	171.92
	STEEL'S Nonferrous Metal Price Index‡	226.0	226.0	241.1
	All Commodities†	181.1	181.6	182.5
	Metals and Metal Products†	188.2	188.2	189.4
†Bureau of Labor Statistics Index, 1926=100. †1936-1939=100. ††1935-1939=100.				



# STEEL'S INDUSTRIAL PRODUCTION INDEX



producers. With their stockpiles sky-high and demand lagging, they can use a little governmental sales help. Miners, returning tomorrow after their 10-day contract-dictated vacation, may find their lost production helpful to balance above-ground coal stocks. In their next-to-last week of work before vacationing—the week ended June 23—miners turned out 11,030,000 net tons of bituminous coal.

## Plant Awards Snap Back...

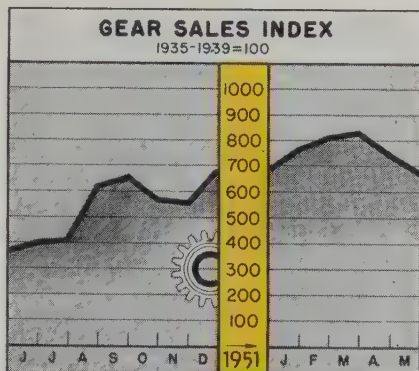
Back on its feet is the awarding of construction contracts, with engineering contracts for the week ended June 28 at \$316.7 million. This

mark is 13 per cent over the average week to date this year, says *Engineering News-Record*. Industrial buildings led the parade with \$100.2 million awarded, well above the \$27.2 million volume of the preceding week. Plant awards for the first 26 weeks of the year are 310 per cent higher than last year's first half. Volume for the first half in total contract awards reached \$7,282.9 million—up 29 per cent over 1950's same period.

## May Business Good...

A look at compilations of manufacturers' sales, orders and inventories for May should shed some light

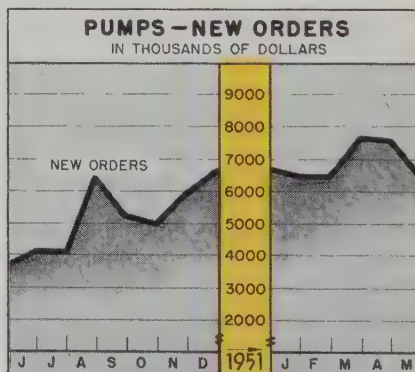
on summer operations. Office of Business Economics claims peak rates for manufacturers' shipments in May, while unfilled orders and inventory book values continued to rise. Billings for May deliveries by the nation's manufacturers reached \$24.5 billion on a seasonally-adjusted basis, up about 5 per cent in the month. Durable-goods industries sales, at \$11 billion, were equal to the March high and about 4 per cent above April. Non-durable goods May sales were up 6 per cent over April. New orders placed with manufacturers during May amounted to \$23.2 billion, about 3 per cent less than in April. Backlog of unfilled orders at the be-



**Gear Sales Index**  
1935-1939=100

	1951	1950	1949
January	764.6	280.2	320.7
February	809.1	272.9	282.3
March	830.7	358.4	299.1
April	742.5	328.6	339.0
May	667.1	363.1	250.1
June		401.0	227.8
July		410.7	193.1
August		617.4	262.0
September		654.5	224.9
October		564.8	242.3
November		554.9	230.7
December		680.4	242.8

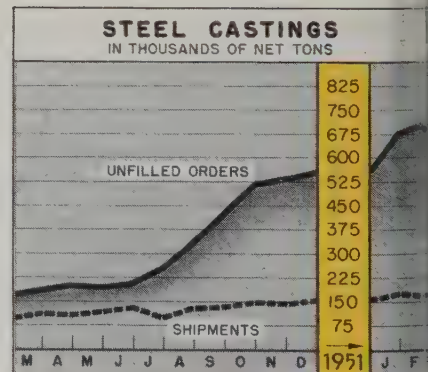
American Gear Mfrs. Association.



**Pumps, New Orders**  
In Thousands of Dollars

	1951	1950	1949
Jan.	6,477	2,586	3,390
Feb.	6,480	2,938	3,247
Mar.	7,654	3,313	3,593
Apr.	7,583	3,376	2,699
May	6,371	3,668	2,775
June		4,153	3,019
July		4,080	3,358
Aug.		6,429	3,767
Sept.		5,191	2,914
Oct.		4,985	2,539
Nov.		5,961	2,525
Dec.		6,720	2,560
Total		53,400	36,386

Hydraulic Institute.



**Steel Castings**  
Thousands of Net Tons

	Shipments		Unfilled Orders*	
	1951	1950	1951	1950
Jan. ....	174.1	89.1	675.4	142.5
Feb. ....	164.0	91.8	707.0	165.2
Mar. ....	....	111.8	....	185.6
Apr. ....	....	107.0	....	201.6
May ....	....	117.9	....	198.0
June ....	....	131.1	....	206.8
July ....	....	98.3	....	255.4
Aug. ....	....	128.4	....	239.9
Sept. ....	....	134.6	....	428.0
Oct. ....	....	149.6	....	521.8
Nov. ....	....	145.9	....	537.7
Dec. ....	....	155.3	....	554.2

\* For sale. U. S. Bureau of the Census.

Charts—Copyright 1951, STEEL



inning of June increased by \$400 million in a month—the smallest monthly gain since the Korean outbreak. Backlogs of durable-goods makers were up \$750 million, while nondurables backlog dropped \$300 million. Inventories shown for the first of June continued to swell, as nearly \$1 billion was added to book value, raising the total valuation to \$38.8 billion. More than two-thirds of the rise was in durables.

## Buyers' Future View Dim . . .

A dim view of future business is taken by the National Association of Purchasing Agents. June survey of members discloses a continuing softening they found in May. Purchasing agents think the deteriorating back order position (see above) is ominous. Materials shortages, summer vacations, and lack of immediate defense and subcontract business will cause slowdowns in July and August, members predicted. Views on forward commitments are conservative—as they were in June, 1950. Most buying is toward the middle or lower end of a 90-day range.

## More Purchasing Power . . .

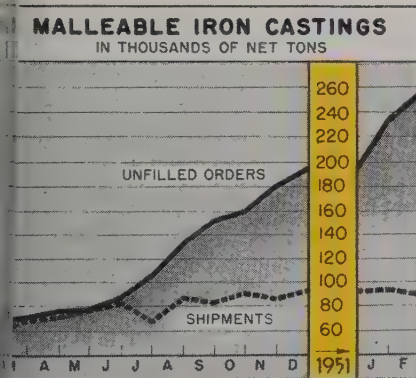
Factory workers' earnings are rising faster than living costs, says the National Industrial Conference Board. Since January, 1950, its price index has risen about 9 per cent, while production workers' weekly earnings have gone up 14 per cent. Straight-time hourly earnings, excluding overtime, are up 10 per cent.

## Trends Fore and Aft . . .

Freight carloadings in the third quarter of 1951 are expected to be nearly 3 per cent above those in the same period of 1950. . . Shortage of steel is forcing National Supply Co. to close its Toledo plant till July 16. . . Thompson Products Inc. expects a volume of \$200 million this year, with \$110 million of it in the second half. . . Stromberg-Carlson Co. will resume full radio-television receiver production next week after a two-month curtailment. . . Business casualties were 9 per cent more numerous in May than they were in April, reaching 775. . . Factory sales of household washers nose-dived in May.

### Issue Dates of Other FACTS and FIGURES Published by STEEL:

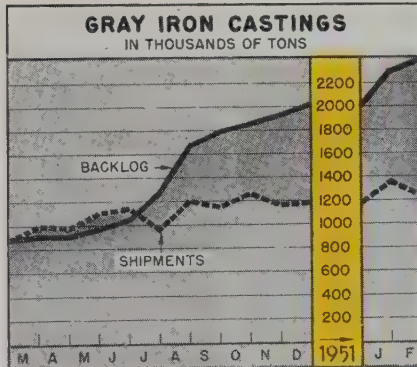
Construction . . . . .	June25	Furnaces, W. Air . . .	May28	Ranges, Gas . . . . .	June4
Durable Goods . . . . .	July2	Indus. Production . .	June25	Refrigerators . . . . .	June18
Employ., Metalwkg. . .	June18	Ironers . . . . .	May14	Steel Forgings . . . .	July2
Employ., Steel . . . . .	June25	Machine Tools . . . .	July2	Steel Shipments . . .	July2
Fab. Struc. Steel . . .	June4	Prices . . . . .	June25	Vacuum Cleaners . . .	June4
Foundry Equip. . . . .	June18	Purchasing Power . .	June4	Wages, Metalwkg. . .	June18
Freight Cars . . . . .	June18	Radio, TV . . . . .	June11	Washers . . . . .	May14
Furnaces, Indus. . . .	July2	Ranges, Elec. . . . .	June11	Water Heaters . . . .	June25



**Malleable Iron Castings**  
Thousands of Net Tons

	Shipments		Unfilled Orders*	
	1951	1950	1951	1950
Jan. . . . .	92.5	62.9	234	62
Feb. . . . .	89.0	60.4	255	67
Mar. . . . .	...	66.3	...	70
Apr. . . . .	...	69.8	...	76
May . . . . .	...	76.2	...	77
June . . . . .	...	82.3	...	87
July . . . . .	...	67.5	...	105
Aug. . . . .	...	86.0	...	132
Sept. . . . .	...	82.5	...	153
Oct. . . . .	...	90.0	...	160
Nov. . . . .	...	85.2	...	180
Dec. . . . .	...	91.5	...	195
Total . . . .	...	920.6	...	...

\* For sale. U. S. Bureau of the Census.



**Gray Iron Castings**  
Thousands of Net Tons

	Shipments		Backlogs*	
	1951	1950	1951	1950
Jan. . . . .	1,364	913	2,298	914
Feb. . . . .	1,234	864	2,392	873
Mar. . . . .	...	996	...	922
Apr. . . . .	...	981	...	922
May . . . . .	...	1,095	...	978
June . . . . .	...	1,136	...	1,040
July . . . . .	...	961	...	1,287
Aug. . . . .	...	1,202	...	1,670
Sept. . . . .	...	1,159	...	1,794
Oct. . . . .	...	1,255	...	1,840
Nov. . . . .	...	1,161	...	1,930
Dec. . . . .	...	1,182	...	2,012
Total . . . .	...	12,905	...	...

\* For sale. U. S. Bureau of the Census.



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Whatever you manufacture or assemble, you can speed production and improve your product by using Pheoll screws, bolts and nuts. These industrial fasteners drive easy and straight, and will not bind because threads are accurately rolled or machined. Precision-made screw and bolt heads, slots and head recesses prevent wrench and driver slippage. Count, too, the added bonus you receive by using fasteners that improve product appearance.

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- Tapping Screws
- Cap Screws
- Sems
- Phillips Recessed Head Screws and Bolts
- Machine Screws
- Special Fasteners
- Thread Cutting Screws

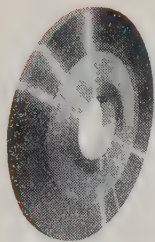
**Pheoll**  
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Industrial Fasteners and Holding Devices



extra stamina for supersonic speeds...

# Heppenstall

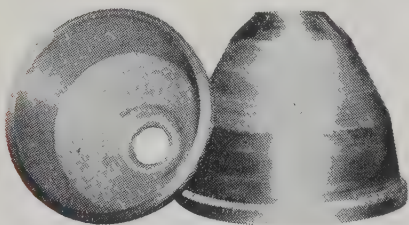
## stainless and high temperature forgings



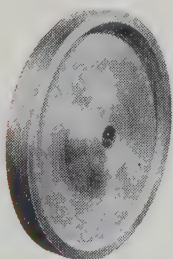
Turbine Disk



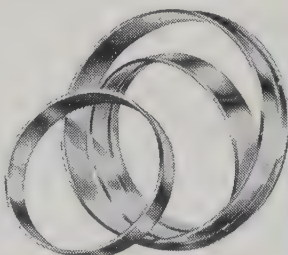
Composite Turbine Wheel



Compressor Cases



Rotor



Stainless Rings

Jet engine hot spots are tough on parts—yet here, as in other applications, Heppenstall forgings give maximum service. They have the stamina and stability to withstand corrosive gases and vibration stresses at elevated temperatures. The fine grain structure and uniform density of Heppenstall forgings yield a proper balance between ductility and high strength.

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**FREE**—144-pg. metallurgical data book, *Tensile and Hardness Properties of Carbon and Alloy Steels*. Write Heppenstall Co., Pgh. 1, Pa., for your 8½ x 11" leather-bound copy.



# Heppenstall

*-The most dependable name in forgings*



# Men of Industry



**EUGENE J. REARDON**

... exec. V. P. at Superior Steel

**Eugene J. Reardon**, vice president, **Superior Steel Corp.**, Carnegie, Pa., was elected executive vice president. Prior to joining the company in 1945 he was chief engineer of **American Steel & Wire Co.** in Cleveland.

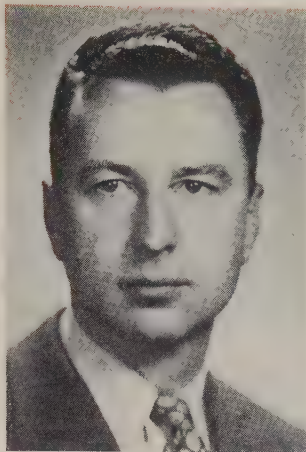
**Laclede-Christy Co.**, St. Louis, elected **J. Douglas Streett** as president and director. He succeeds **Donald N. Watkins** who has resigned as president, general manager, treasurer and director. **A. B. Agnew** was elected president of **Laclede-Christy Co.** of Pennsylvania, a subsidiary, and also serves as vice president in charge of operations and director of the parent company. Mr. Streett has been vice president in charge of development of **Granite City Steel Co.**

**Savage-California**, Los Angeles, appointed **Cyril R. B. Harding** vice president, manufacturing. He was formerly with **Great Lakes Steel Corp.**

**Howard J. Davis** was appointed assistant to the executive vice president, **Colorado Fuel & Iron Corp.**, Denver. He has been assistant to the vice president—sales.

**Air Reduction Co. Inc.**, New York, appointed **S. D. Baumer** vice president of the equipment manufacturing division. He joined **Airco's** general technical sales department in 1941 as steel mill specialist, was appointed assistant manager of that department in 1944 and manager in 1948.

**Whiting Corp.**, Harvey, Ill., elected **Stevens H. Hammond** chairman of the board. **J. A. Handley** continues as vice president and chief executive officer.



**MEL E. MAUER**

... directs mfg. at Nesco

**Mel E. Mauer** was appointed director of manufacturing operations for **Nesco Inc.**, Chicago. Before joining **Nesco** he was with **Hotpoint Inc.** for four years, responsible for all planning and expansion of manufacturing facilities. Prior to that he was with **Lockheed Aircraft Co.**

**E. A. Tranter** was appointed comptroller of **Line Material Co.**, Milwaukee. He succeeds **W. S. Pierick**, who left the company recently after serving many years as vice president and treasurer. **G. O. Miller** was appointed to assist Mr. Tranter in the dual role of assistant general comptroller and field comptroller.

**L. E. Menns** was appointed Pacific Coast sales manager, **Bridgeport Brass Co.**, Bridgeport, Conn. He has served as Los Angeles district manager. He now is in charge of the San Francisco district office and warehouse as well, and will be responsible for the sale of all **Bridgeport** products on the Coast.

**David C. Hall** was elected president and general manager, **Diamond Mfg. Co.**, Wyoming, Pa. He was vice president and purchasing agent. **Frank Foster** continues as vice president in charge of production and sales.

**Martin J. Holleran** was named assistant manager of tool steel sales by **Carpenter Steel Co.**, Reading, Pa. He joined **Carpenter** in 1946 and served as sales engineer out of the New York mill-branch warehouse.

**Lawrence L. Garber**, general manager, **American-Fort Pitt Spring Division**, H. K. Porter Co. Inc., Pittsburgh, was elected a vice president.



**G. O. LOACH**

... director and V. P. of Electromet

**G. O. Loach** was elected director and vice president of **Electro Metallurgical Co. of Canada Ltd.**, Welland, Ont., Canada. He has been connected with sales and technical service activities of the company since 1945. Before joining **Electromet** he held technical and supervisory positions with several foundries and steel mills.

**Douglas J. Donohue** was appointed Atlantic district sales manager for **Trumbull Electric Department**, General Electric Co., Plainville, Conn. His office will be in Philadelphia.

**Thomas E. Eagan** was promoted to research metallurgist by **Cooper-Bessemer Corp.**, Mt. Vernon, O. **W. R. McCracken** is now in charge of the foundry research laboratories in Grove City, Pa., and will also supervise materials control of foundry operations in both the Mt. Vernon and Grove City plants.

**C. R. Horton Jr.** was appointed manager of the engineering development department of **Dravo Corp.'s** engineering works division, Pittsburgh.

**Stephen P. Curtis**, chief construction engineer, construction engineering bureau-manufacturing division, **United States Steel Co.**, was assigned as project construction manager in charge of construction of **Fairless Works** near Morrisville, Pa.

**Air Reduction Sales Co.**, division of **Air Reduction Co. Inc.**, New York, appointed **Walter Goerg Jr.** in charge of business and technical paper advertising. He was in charge of printing production. Mr. Goerg succeeds **William C. Bettles**, who was appointed



ed advertising manager of Airco Co. International, a division of Air Reduction Co. Inc.

**Clearing Machine Corp.**, Chicago, appointed **Eugene P. Cunningham**, for-



EUGENE P. CUNNINGHAM

... *Clearing Machine sales manager*

merly of its Detroit office, as sales manager succeeding **M. E. Peterson**, who assumes management of the Clearing operations in Joliet, Ill., where a new plant is to be built. **Ervin J. Baumrucker** was named assistant sales manager. **Charles Kauderer** replaces Mr. Cunningham in charge of the Detroit office.

**D. V. Lemery** was named assistant sales manager, **McCulloch Motors Corp.**, Inglewood, Calif. He formerly was in charge of the Ontario, Canada, office of Lemery's Distributors Ltd.

**Robert E. Penney** was appointed Pacific Coast district manager, **Crane Co.** He was manager, Los Angeles branch.

**Cuno Engineering Corp.**, Meriden, Conn., appointed: **Carlton H. Winslow**, assistant general manager; **James A. Plummer**, general sales manager; and **Durbin H. Van Vleck**, head of engineering sales department.

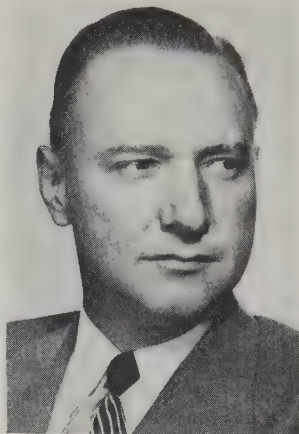
**A. E. McRae** was appointed superintendent of the new gun plant of General Motors Corp.'s Oldsmobile division, Lansing, Mich. **Robert T. Rolis** was promoted to superintendent of the pressed metal and plating plant, succeeding Mr. McRae. **Edward C. Gerke** was appointed inspection superintendent of the gun plant and **Arnold I. Hansen**, assistant superintendent under Mr. McRae.

Heading new departments at **Armco Steel Corp.**, Middletown, O., **J. H. Ayres** was appointed manager of pensions and insurance; **E. L. Brooks**,

manager of personnel research, continuing with matters involving pay methods and practices; **George M. Hill**, staff supervisor of employment, assisted by **Rowan F. Crawford**; **W. T. Maxwell**, staff supervisor, Armco Drainage & Metal Products Inc., personal relations. **C. M. Allen** was appointed chief safety engineer. **J. G. Purvis** continues as staff supervisor of training.

**Electric Metal Makers Guild Inc.**, Pittsburgh, elected the following officers for the coming year: President, **C. C. Spencer**, Electric Steel Casting Co.; vice president, **J. H. Baldrey**, Allegheny Ludlum Steel Co.; and secretary-treasurer, **C. B. Williams**, Massillon Steel Casting Co.

**Loring S. Brock**, formerly manager of sales-manufacturing accounts for the Los Angeles office of **Columbia Steel Co.**, U. S. Steel Corp. subsidiary,



LORING S. BROCK

... *district sales mgr. at Columbia*

was appointed manager of sales for the inter-mountain sales district, with headquarters in Salt Lake City, Utah. He is succeeded in Los Angeles by **Burton C. Smith**, a senior technical field representative.

**D. V. Sherlock**, a director and vice president of **Blaw-Knox Co.**, Pittsburgh, and president of its Union Steel Castings Division, has retired but continues as a director.

**Lionel E. Booth** is now associated with **Hardinge Co. Inc.**, York Pa. He will direct activities of its Salt Lake City, Utah, office, now being re-established. He also continues his former engineering activities and sale of the Booth flotation machine of Booth Engineers. His offices are at 146 S. W. Temple St., which is also designated as a Hardinge district office.

**Harry L. Erlicher**, vice president, Gen-

**eral Electric Co.**, Schenectady, N. Y., was named special assistant to Under Secretary of the Army Archibald S. Alexander. Mr. Erlicher will be in charge of Army procurement and production expediting in the office of the Under Secretary.

**Robert Schenck**, chief metallurgist, **Buick Motor Division**, Flint, Mich., General Motors Corp., and one of the nation's early exponents of the use of boron-treated steel, has retired after 36 years of service. He was a metallurgical engineer at Buick when he became interested in boron steel which uses fewer critical materials. His studies resulted in appointment as supervisor of research at Buick for the National Research Council during World War II. Under his supervision as chief metallurgist Buick adopted high manganese steels for axle shafts and steering gear parts.

**Stanley E. Tims** was appointed manager of the new plant of **Daystrom Inc.**, Eynon, Pa. He formerly was assistant to the manager of Saco-Lowell Shops, Saco, Me.

**Harry E. O'Grady** was appointed purchasing agent of **Ford Motor Co.'s** stamping plant in Buffalo. He succeeds **I. A. Holland**, transferred to a similar post in the company's engine and foundry plant under construction in Cleveland.

**Richard W. Sabine**, former senior staffman in charge of mechanical goods advertising and sales promotion for **Goodyear Tire & Rubber Co.**, Akron, was named manager of dis-



RICHARD W. SABINE

... *Goodyear distributor sales*

tributor sales in the company's mechanical goods division. He succeeds the late **W. T. Bell**.

**J. H. Waterbury** was appointed assistant manager, engine division, Pa-





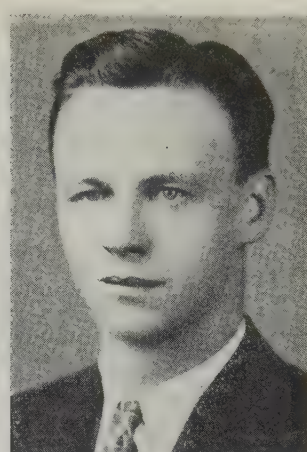
JAMES P. STEWART

... new president of De Laval



CLAUDE O'MALEY

... V. P. Moto-Mower, Richmond plant



ARTHUR J. WILLIAMSON

... V. P.-mfg., Tube Reducing

ific Airmotive Corp., Burbank, Calif.

De Laval Steam Turbine Co., Trenton, N. J., elected **James P. Stewart** president. He previously served as executive vice president. **Wencel A. Neumann Jr.** was elected vice president of industrial sales; **H. B. Bauer**, vice president of engineering, continuing as manager of marine sales; and **Charles A. Jurgensen**, vice president of manufacturing, continuing as networks manager.

**Gordon Groth** was appointed executive vice president, **Erie Resistor Corp.**, Erie, Pa. He formerly was president of Electra Mfg. Co. in Kansas City, Mo.

**Federated Metals Division**, American Smelting & Refining Co., appointed **A. E. Buchanan** as sales representative to cover North and South Carolina, the eastern half of Georgia and most of the western part of Florida. His territory is under the jurisdiction of Federated's Baltimore office.

**National Association of Fan Manufacturers** elected **John M. Frank** president for the ensuing year. Mr. Frank is president of Ilg Electric Ventilating Co., Chicago.

**Moto-Mower Co.**, Detroit, elected three new vice presidents: **Claude O'Maley** will be in charge of manufacture at the Richmond, Ind., plant; **John S. Slick** is vice president-operations and comptroller; and **Renville Wheat** is vice president, secretary and legal counsel. Mr. O'Maley has been with the company since 1945 and associated with the lawn mower industry for many years. Mr. Slick was formerly vice president and treasurer of Graham-Paige and secretary of Kaiser-Frazer Corp. Mr. Wheat is of the legal firm, Dykema, Jones & Wheat.

**Robert M. Lundgren** was appointed vice president, **Kuljian Corp.**, Philadelphia. He will have charge of Kuljian's sales program.

**George M. Streicher**, vice president-manufacturing, was promoted to general assistant to the president of **Monroe Auto Equipment Co.**, Detroit. **Leo J. Fairchild** was made general production manager; **Walter Phelan**, planning manager; and **Herb Ott**, central estimating.

**Forest H. Humphreys** was appointed manager, property department, **American Car & Foundry Co.**, New York. He succeeds **John H. Green**.

**Arthur J. Williamson** was appointed vice president in charge of manufacturing operations, **Tube Reducing Corp.**, Wallington, N. J. For the last 13 years he has been with Sumner Tubing Co.

**Raymond C. Freeman** was named manager of **General Electric Co.**'s welding divisions at Fitchburg, Mass. **Alanson U. Welch** succeeds Mr. Freeman as manager of engineering for the divisions. **Alfred F. Fields** was named manager of mold manufacture, plastics division, chemical department, Pittsfield, Mass., to succeed **G. Arthur Gustafson**, temporarily assigned to the post in addition to his duties as manufacturing and materials engineer. **W. R. Burrows** and **R. E. Coutant** were made assistants to the managers of engineering and sales, respectively, in the aeronautic and ordnance systems divisions of the company.

**William J. Muller** was appointed export manager for **Southern Alkali Corp.**, subsidiary of Pittsburgh Plate Glass Co., Pittsburgh. Before joining Southern Alkali he was treasurer of U. S. Alkali Export Association Inc. His headquarters will be at 30 Rockefeller Plaza, New York.

## OBITUARIES...

**W. D. Falkenstein**, 56, Pittsburgh district manager, **Electric Controller & Mfg. Co.**, Cleveland, died June 21.

**Abraham Newman**, 66, president of **A. Newman & Co.**, St. Catharines, Ont., Canada, died June 27.

**John Wilkinson**, 83, inventor of the air-cooled engine and numerous im-

provements on automobile motors, died June 25 at his home in Syracuse, N. Y. He was chief engineer and vice president of **H. H. Franklin Mfg. Co.**, Syracuse, until he retired in 1926.

**Henry R. Turner**, 51, a special engineer at the Lackawanna, N. Y., plant of **Bethlehem Steel Co.**, died June 24. He formerly served as general superintendent of the mechanical division

at the Lackawanna plant and in 1949 was named special engineer.

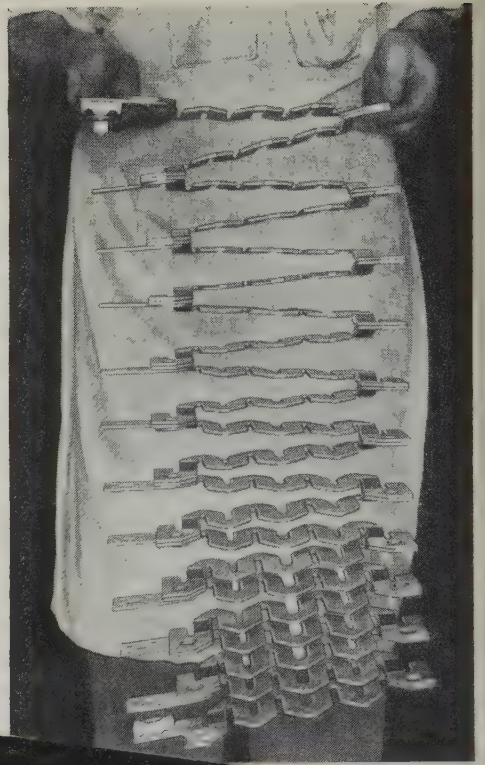
**William B. Brendlinger**, 72, sales manager, **Ingersoll-Rand Co.**, Philadelphia, died June 26. He was with the company 50 years.

**Michael Martinek**, 67, founder and owner of **Western Wire & Iron Works Inc.**, Chicago, died June 27 while on a business trip in Binghamton, N. Y.



# NO BURNING

at Grid-eyes  
or at Tap-plates



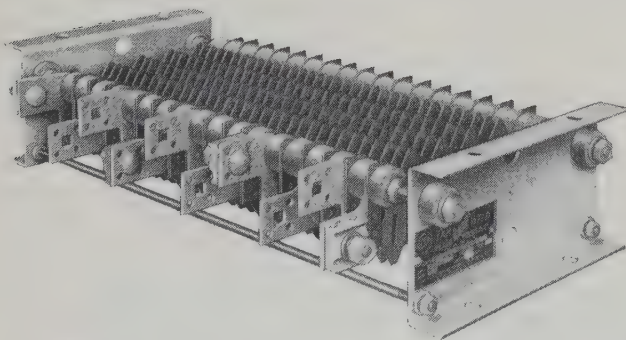
## Less Up-Keep with

Resistors get little attention, because they are usually mounted overhead or in similar hard-to-reach locations. Clamping-nut pressure slackens under alternate heating and cooling. Formerly, under the reduced pressure, OHMIC value changed, burning occurred and often was *not* noticed until damage took its toll.



*But*—note how resistor troubles are now eliminated in the EC&M TAB-WELD design! The current-carrying path is continuous—and is *independent* of end clamping-nut pressure. Convenient tap-plates simplify tap-shifting—make possible small adjustments in resistance value, because plates are closely spaced. Also, these alloy-steel resistors are corrosion-resisting—and have negligible resistance-change between cold and maximum working temperatures.

**SPECIFY EC&M BULLETIN 942-A  
TAB-WELD PLATE RESISTORS FOR  
CRANE AND MILL AUXILIARY  
CONTROL**



**THE ELECTRIC CONTROLLER & MFG. CO.**  
2698 EAST 79TH STREET  
CLEVELAND 4, OHIO



## LATEST ON CARTRIDGE CASES.

Low-carbon  
autobody stock has been proved a suitable  
material for cartridge cases used in low power  
weapons like howitzers, and medium-carbon heat  
treated steel, WD-1030, is satisfactory for cases in  
all other weapons now under consideration. The  
Army and Navy have joined hands in furthering  
the development and standardization of steel cases,  
placing some contracts and setting up standby  
plants. Most cases are fabricated by a combina-  
tion of drawing and extrusion, contributing to con-  
servation of material. Newer types, like those for  
recoilless rifles, call for specialized techniques. One  
involves rolling up a preperforated sheet to cylin-  
drical shape, welding the seam and welding on  
the head piece.

—p. 72

—p. 72

## ANOTHER TITANIUM PROJECT— New sys-

**ANOTHER TITANIUM PROJECT—** New system for titanium reduction has been perfected by an eastern research organization which has organized a company capitalized at around \$1 million for undertaking the work on a production scale, envisaging costs of something under \$1 per pound, comparing with present cost of \$5 per pound for titanium sponge. A large steel fabricating interest has invested funds in the venture and plans are under way for a pilot plant for which equipment has been ordered. Initial production is six months to a year away. The project is staffed by experienced engineers and metallurgists, making it anything but a fanciful promotion scheme.

## PRACTICAL FOUNDRY TRAINING—Largest

and most completely mechanized research foundry in the world is going up at General Motors' new research center just outside of Detroit. The installation will cost \$1.2 million, has two primary purposes—improved foundry processes and development of trained foundrymen. Final stage of construction will be completed this year and the entire unit will be manned by college graduates. Average age of the first group to be hired was 25; full staff will be about 65 persons. The research unit will be able to produce experimental castings in practically the entire size and weight range covered by GM's 13 production foundries in the U.S. and Canada.

### DESCALING REVERSION—Tightening of sul-

**DESCALING REVERSION**—Tightening of sulphuric acid supplies and difficulties encountered in reclaiming or disposing of spent pickling liquor are persuading some wire drawers to turn back to the 20-year old (or more) process of mechanical descaling of rods. It involves little more than flexing the rod through two sets of rolls, vertical and horizontal, before it enters the first die of the wire machine, the rolls being driven by the rod. Small amounts of scale still adhering can be scoured off by

wire" brushes driven from the straightening rolls, or by working out an arrangement for giving the rod a slight stretch between the rolls and the die. Some veterans in the trade think the cold working effect of mechanical descaling gives a better rod than the pickled variety, the latter of course always being subject to hydrogen embrittlement.

**FINE FILTERING**—An absolute air filter, devel-

oped originally for the Atomic Energy Commission and capable of removing better than 99.98 per cent of all dust, smoke, fumes, radioactive particles, spores and other microscopic foreign matter from air, is now in quantity production for commercial use. Filtering material is a soft, felt-like paper made of specially treated pulp and containing very fine asbestos fibers. The paper is folded and packed into the filter in an accordion pleat arrangement to provide an extensive filtering area within a small space. Two sizes are made, both 24 inches square and one 5½ inches, the other 11½ inches deep.

**SOUNDING OFF**—Ultrasonic testing is being

used on blooms rolled from ingots of high-quality steel to indicate how far segregation and piping extend down from the top. No two ingots are the same in this respect, and any rule-of-thumb such as cropping 10 per cent from each bloom may be wasteful in one case, unsafe in another. Ultrasonic equipment will indicate the exact degree of cropping that should be done.

## PROBING SEGREGATES—Continuous analysis

of the variation in content across a steel segregate has been made by means of the spectrograph, using a highly localized condensed spark and a moving photographic plate. In such fashion a spectrogram was obtained on which the spectral lines vary in density over their length according to local changes in composition of the specimen along the path of the spark. Traverses were on the order of 2 centimeters. —p. 78

—p. 78

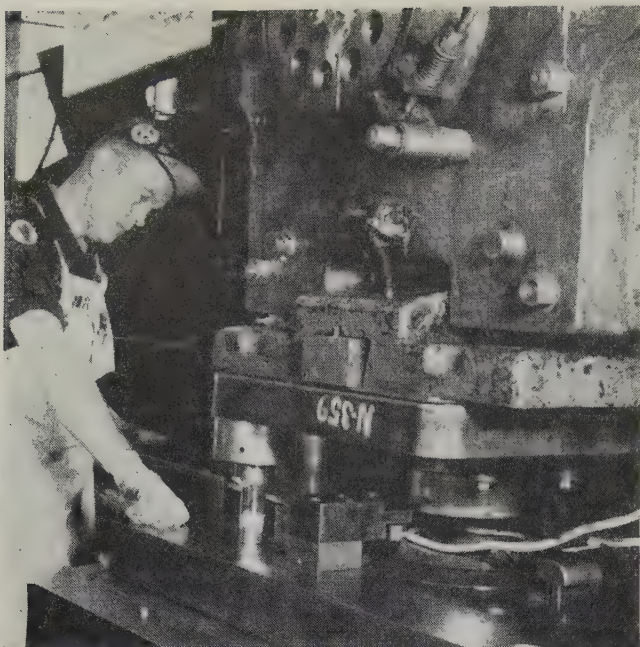
**TECHNOLOGISTS:** Stocking-out washed iron

ore at a rate up to 600 long tons an hour is possible with new types of conveyor belt stackers of the traveling type (p. 96) . . . Handling of large stampings between press operations is facilitated by iron hand devices for which several different types of grippers have been devised (p. 84) . . . Savings of 30-40 per cent in normal machining time have been realized with machine parts of Meehanite metal cast by the shell molding process (p. 82) . . . Sixth installment of STEEL's comprehensive series on cold rolling of strip steel (p. 86) deals with practical problems like wavy edges, weld breakage, particle pickup, mill vibration and skidding. A.H.A.

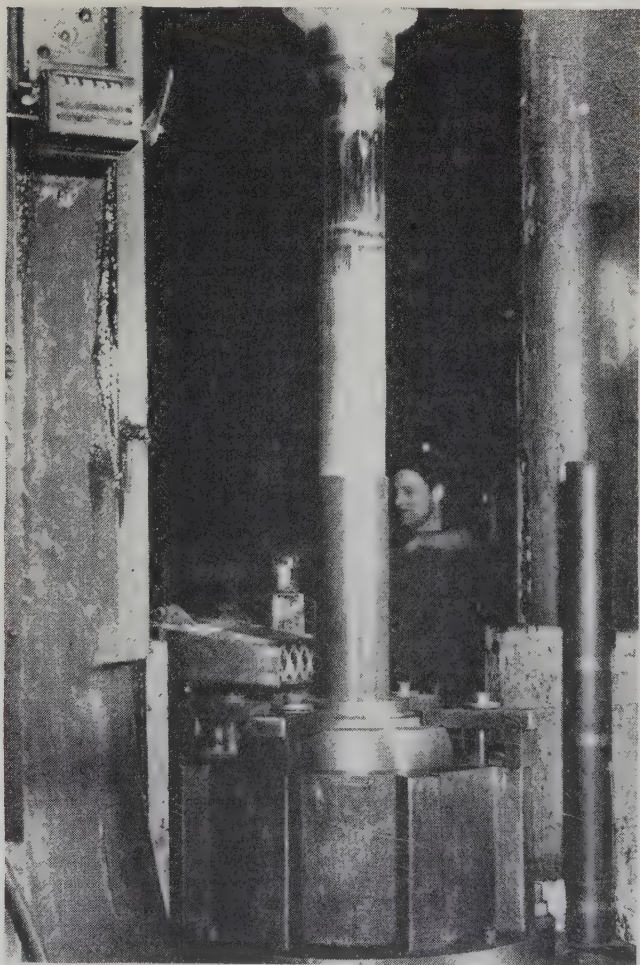
A.H.A.

[illegible]





Blanking operation (above) is the first step in drawing steel cartridge cases by the disk and cup method. Sheared strips from steel plate are shown here being fed into blanking die at Norris-Thermador Corp. Below is the drawing operation, with punch entering mouth of drawn case set in nest ring on top of die



## Extruded and Drawn Steel Cartridge

Two prime factors—availability of material and superior physical properties of the finished cases—are combined in the joint Army-Navy efforts to perfect techniques for mass-producing artillery components from low and medium carbon steel. Sizes range from 20mm to 155mm

By W. F. STEVENSON

Civilian Chief  
Ammunition Branch, Industrial Division,  
Office, Chief of Ordnance

IN ANY future emergency artillery cartridge cases must be fabricated from steel. The copper and zinc required for cartridge brass will not be available in sufficient quantity. Further, new weapons and rounds under development require physical properties in the cartridge case decidedly beyond the range possible in the brass alloys, but well within the range of steel.

The technology of steel cartridge case manufacture is highly involved and difficult compared with fabrication from brass. It requires trained metallurgists and engineers for supervision and direction to a much greater extent than would be required for brass fabrication. The actual manufacturing operations require that operators and supervisors be thoroughly trained and skilled in the art of deep drawing of steel.

The heat treatment, when required, is of particular importance and needs constant vigilance to insure that once properly established it is rigidly controlled against any variations. This also requires uniformity in the steel as regards its chemical composition and other characteristics that may affect hardenability. Each heat of steel must be examined and the heat treatment cycle changed as required.

**Performance Superior**—Cartridge cases fabricated from steel should be decidedly superior in performance to cases of the same type fabricated from brass. Very little can be accomplished in the way of increasing the physical properties of brass cartridge cases by a change in chemical composition even though copper and zinc were available. For steel cartridge cases it has been demonstrated that non-heat treated low carbon steel, WD-1010 or auto body stock will be satisfactory for those required for low power weapons such as the 75mm and 105mm howitzers and that heat treated medium carbon steel, WD-1030 will be satisfactory for all other weapons now under consideration. Much higher physical properties (if needed) are attainable through the use of heat treated alloy steels. Such steels can be extruded and drawn with little more difficulty than straight carbon steels.

The steel must be of good quality, well killed, uni-



# Cases Advance Toward Standardization

form and relatively free of nonmetallic inclusions. Standard specifications are available for the steel for the conventional cup and draw method from disk and tentative specifications have been prepared for the steel to be used in cold extrusion.

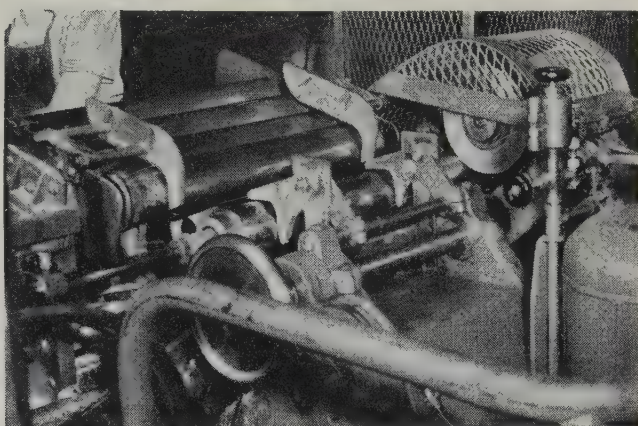
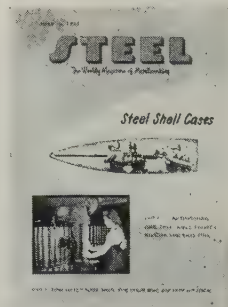
Brass has the tendency to season cracking or age hardening—not suffered by steel. This can be overcome to a great extent by stress relieving or low temperature annealing. However, fired brass cartridge cases, unless cleaned very shortly after firing cannot be resized and reused because they will crack and split, apparently on account of the severe corrosive action caused by the residue in the gases from our FNH powders. Steel cartridge cases fairly badly pitted from deliberately caused corrosion can be successfully resized and reused.

**Joint Army-Navy Attack**—It is not possible simply to substitute steel for brass in a cartridge case line. That was tried during the past war when attempts to fabricate cartridge cases from steel on a production basis were only sporadically successful. The technical difficulties encountered in wholesale transfer of fabrication to steel are fully recognized. Consequently each cartridge case is considered as a separate problem.

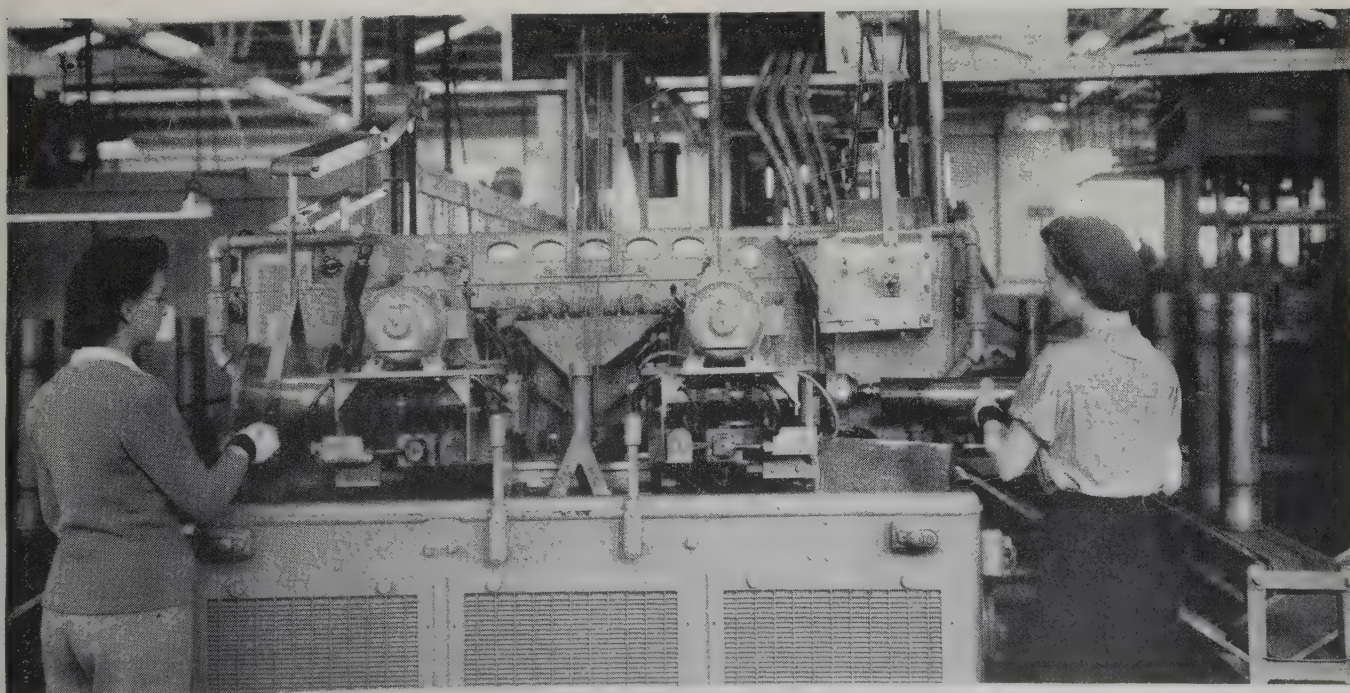
Because manufacture of steel cartridge cases is inherently difficult, the problems involved are being jointly attacked by the Navy Bureau of Ordnance and the American Ordnance Association cartridge case committee.

Specification requirements, including methods of

ALTHOUGH Ordnance's General Davis recently characterized the steel cartridge case program of the last war "a complete flop", research and development has been carried forward since then to the point where now both Army and Navy are gradually standardizing on steel cases in all sizes from 20-mm up to 155-mm.



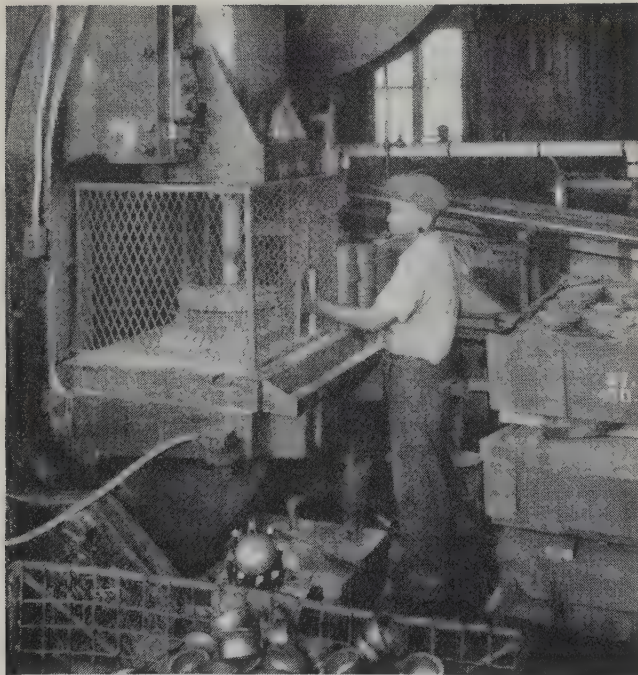
Rotary trimming machine (above) provides an even rim essential for tapering, also at Norris-Thermador. Below is induction heat treating equipment with two stations for heating and quenching the lower sidewall of steel cases







Steel cartridge cases are inspected visually for defects, particularly in the protective surface coating, at the Norris plant



testing, number of test samples, lot sizes, testing equipment, etc., will be as much alike for the two services as requirements in end product will permit. Close similarity will be helpful and will save confusion or adverse criticism on the part of contractors who may be shared by both services. Also, close similarity will simplify the training of Army and Navy inspectors.

Even the method of dimensioning drawings is being brought into close similarity wherever feasible. There had been a basic difference in the method of dimensioning tapered surfaces and the Army method has been adopted by the Navy.

**Standby Plants Established**—A further example of

Following illustrations show manufacture of 57-mm steel cases at Frankford Arsenal. To the left is the precup operation, starting from steel disks; lower left is the heading operation, and directly below is shown rough turning the head





This co-ordinated action and policy is the establishment of joint Army-Navy steel cartridge case standby plants. The Ordnance Corps of the Army has standby plants for the production of artillery projectiles, bomb bodies, powder, high explosives and loading. The Navy Bureau of Ordnance has one standby plant for the manufacture of 40mm steel cartridge cases. This situation led the Chief of the Bureau of Ordnance, slightly over two years ago, to propose that this bureau and Army Ordnance budget for the establishment of a joint Army and Navy standby plant, primarily for the production of the Army 90mm and 105mm steel cartridge cases and for the Navy 3-inch and 5-inch steel cartridge cases. This plant should be in operation in the fall of this year.

Establishment of this standby plant is conservatively estimated to gain a minimum of at least one year's invaluable lead time. This joint facility will permit a vital flexibility in the control and adjustment of steel cartridge case manufacturing schedules. Necessary adjustments or cutbacks in the production of individual items may be accomplished without the permanent loss of highly skilled, thoroughly trained operators, so essential to steel cartridge case manufacture. Except for the standby 40mm case shop of the Navy in Detroit and the plant of Norris-Thermador Corp., (formerly Norris Stamping & Mfg. Co.) Los Angeles and the Fulton Sylphon Co. in Knoxville, Tenn., the limited capacity of Frankford Arsenal and the Naval Gun Factory in Washington, neither service has a facility for the war manufacture of artillery steel cartridge cases.

The Naval Ordnance Plant at Louisville was selected as the site for this standby plant. Consideration of these factors was involved in the selection of the site:

- (1) That there be a minimum investment in real estate so as to allow concentration on valuable equipment and its installation.
- (2) That the site be convenient to a source of steel and, since cartridge cases are bulky to ship, the plant

Perforating operation on steel case for recoilless rifle projectile is shown below, as handled at Frankford, while at the lower right cases are being removed from an oven used for baking the phenolic varnish finish, reading for stenciling and packing

must also be suitably located with respect to the loading plants that will use the cases.

- (3) That the selection of a desirable contractor-operator (wartime) be combined with the final choice of the site.

Louisville location seems to meet all these factors. It has plenty of space and is adequately suited in the way of power requirements; a very well equipped tool room and gage laboratory are available. Potential operator of the plant, is Clayton-Lambert Co., operator of the World War II Navy plant for manufacturing 40mm steel cartridge cases.

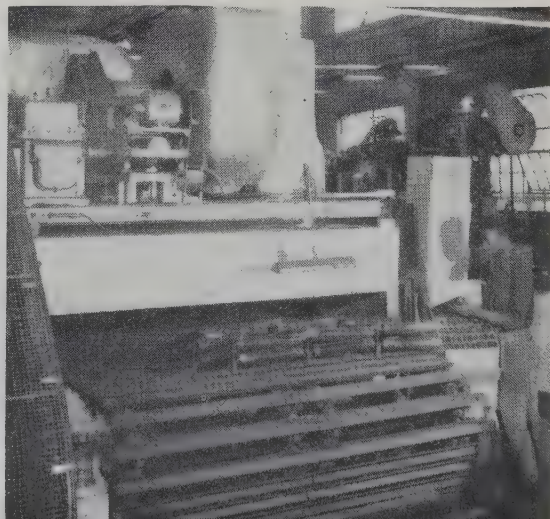
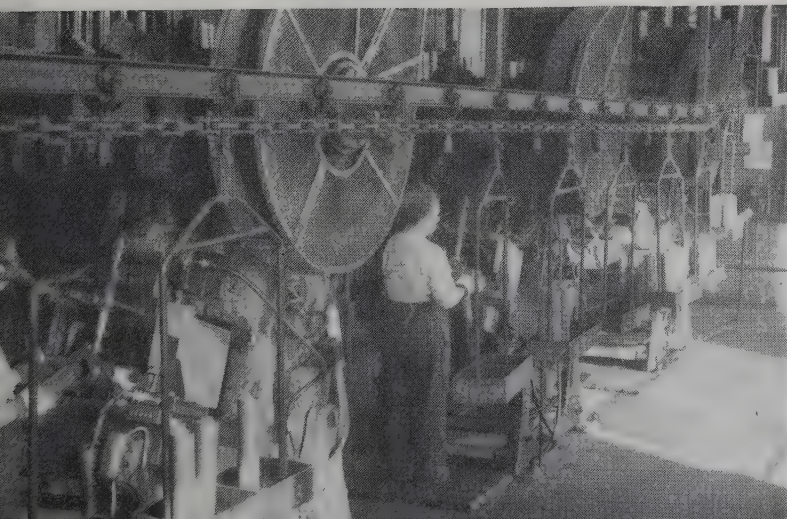
**Norris Gets the Contract**—Contract for the engineering work, the procurement and installation of equipment was let by the Navy to Norris-Thermador Corp. That company was the outstanding producer of steel cartridge cases during World War II and has been the only commercial facility for steel cartridge cases for Army and Navy procurement since that time.

The contract covering the installation of equipment for steel cartridge case manufacture at the standby Army-Navy plant does not cover the development of suitable manufacturing methods. It presupposes that suitable methods have been established—that descriptions of manufacture will be available.

To meet this requirement, Army Ordnance has taken the following action:

- (1) An industrial mobilization study was contracted with Norris for the development of a method of manufacturing the 90mm steel cartridge case.
- (2) Contracts were negotiated with that same company to develop the 75mm skysweeper and 76mm tank gun cartridge cases from steel.
- (3) Frankford Arsenal will develop the 120mm steel cartridge case.
- (4) Similar work has been initiated to cover the steel cartridge case for the 105mm howitzer. That case was successfully produced during the war and much manufacturing data on it are available. Only minor work remains to prove the process which was most satisfactory during the war and to incorporate the developments of investigations that have been made since then.

This standby plant will be laid out and equipped to make steel cases by the disk and cup method with provision for cold extrusion from bar with the least



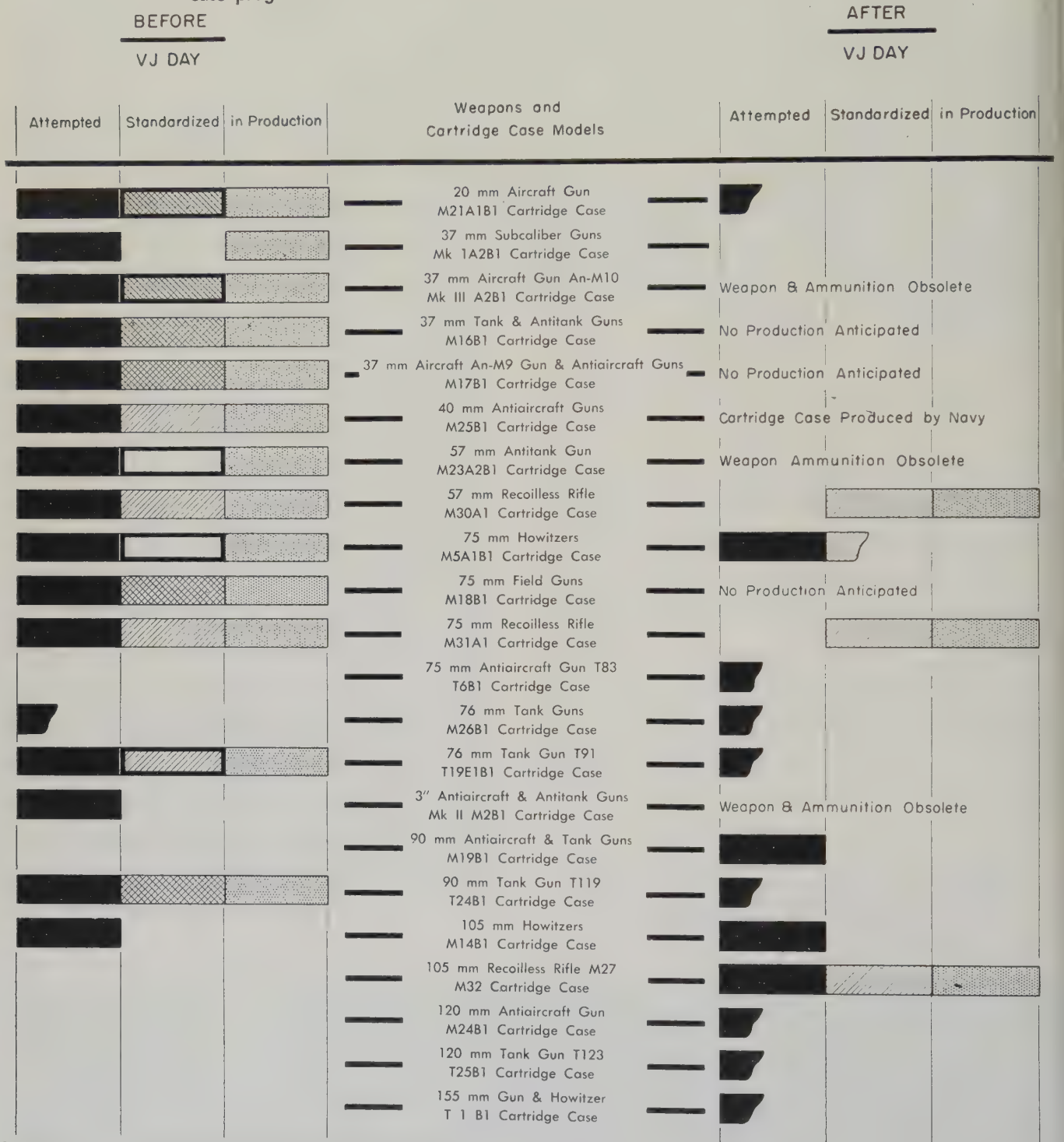


change over, when that method has been adopted.

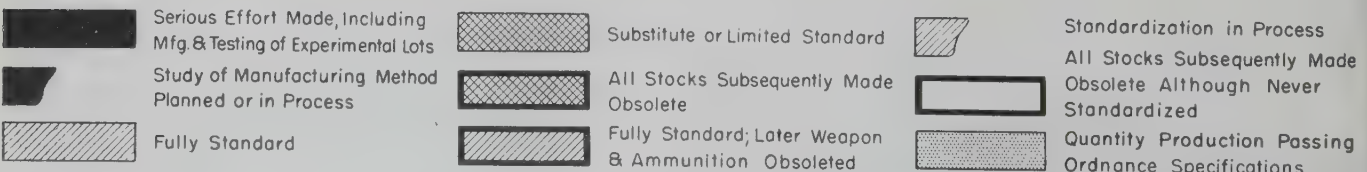
**Installation Costs High**—Another and larger joint plant in a different geographical location is currently under consideration. Also under consideration is the establishment of an Army steel cartridge case stand-

by plant. This latter was decided under the policy that it would be more economical to have a case plant in government real estate. The cost of installation of the heavy presses is about 20 per cent of the cost of the presses themselves. If installed in private industry eventually the (Please turn to Page 98)

Chart showing status of the various steel cartridge case programs



Legend





**ALL BEARING SLIDES:** Among significant innovations in reciprocating slides on machine tools, are those which roll on ball bearings. An example of their successful use is in surface grinder design—particularly in work tables and elevating mechanisms where sensitive “feel” is desirable.

While these grinder slides generally follow the pattern of the familiar roll carriage on typewriters, other machine tools now incorporate cylindrical multi-row ball cages in conjunction with cylindrical bar ways. It is interesting to note that cylindrical ways—which went into eclipse following wide use on early machine tools—have staged quite a comeback of late.

Slides always have represented trouble areas in machine tools. Plain slides sometimes bind and wear excessively when tightly fitted. On the other hand, when loosely fitted, they become unduly cushioned by oil films and this disturbs machining accuracy.

Properly designed and accurately constructed ball bearing slides can be preloaded to give solid support without introducing binding and frictional wear. Designers who consider all reciprocating slides to be necessary evils, claim that those running on ball bearings come closer to giving the solid support of an integral structure than any other form of what the more cynical refer to as “cob house construction”.

Champions of plain slides counter by saying that through proper provisions for lubrication, their surfaces actually “roll on molecules of oil”. If that be true, it looks almost like an argument in support of ball bearing slides.

**SELLING ISN'T DEAD!** About this time of year, 1948 through 1950, National Machine Tool Builders' and American Machine Tool Distributors' associations jointly sponsored machine tool sales refresher courses at Cornell and other universities. This year there is a break in that chain. There are to be no 1951 sessions.

This break—coupled with widespread belief that orders long will continue to pour in through office transoms—is inspiring absurd remarks such as, “Sales training in the machine tool industry is a dead duck!” Such statements are completely unwarranted. They are completely untrue.

The spirit of scientific selling still is very much alive in the machine tool industry. It is reflected in current advertising campaigns. Individual study of basic principles by machine and tool salesmen is being actively encouraged. The sales refresher courses undoubtedly will be resumed when key men of the industry again are free to devote their time and talents to planning and teaching these courses.

Good textbooks are even more important for individual study than they are for group training in classrooms. Therefore, the appearance at this time of an accredited book on application at plant level of the so-called “dynamic equipment policy” is most timely. It certainly helps to prove that machine tool

salesmanship continues to be a recognized profession.

This book—entitled *Company Procedural Manual on Equipment Analysis*—is published by William Kelly & Co., 120 LaSalle St., Chicago 3. It costs \$5.00. It is based on the working experience of this management consulting organization in applying the MAPI formula to equipment replacement in a noteworthy group of companies including Allis-Chalmers, Cooper-Bessemer, Jones & Lamson, Sundstrand and Worthington Pump & Machinery.

William J. Kelly, who wrote the foreward, is president of Machinery & Allied Products Institute, whose research director George Terborgh was largely responsible for developing the MAPI formula. Mr. Kelly's partner, Alexander Konkle, a man with broad experience in applying this formula in industry, had a major role in preparing the text.

The MAPI formula is becoming recognized as an economic “measuring tool”, invaluable not only to sellers of machines but equally so to purchasers thereof. No measuring tool is effective, however, unless used properly. I recommend this book as “the practical operating manual for the MAPI formula”.

**DON'T BE HALF SAFE:** The slogan which introduces this item is even more important as applied to elimination of operational hazards from industrial machinery than to elimination of social hazards associated with athletic activities.

In other words, a so-called “safety device” which is only half safe, or even only 99 per cent safe, is a delusion and a snare. It can be compared to the magic powder concocted by Merlin. This was sprinkled on knights to make them invisible to their foes—but didn't.

One of the problems in safety engineering on automatic machines, is to keep hand operating cranks and handwheels from spinning around when the machine is switched to high speed automatic control. Dependence on operators to disconnect these cranks and handwheels is not enough. Memories will fail and arms and wrists will be broken—just as they were when cranking up oldtime automobiles.

Disconnection must be 100 per cent automatic and it must be 100 per cent effective. I recall a case many years ago when a safety device was designed to disconnect the hand cranking mechanism used in setting up a multiple spindle automatic. After it was built someone discovered that it could be ineffective if the machine should happen to stop with a certain roll resting on the peak of a certain cam.

A series of experiments and a lot of conferences with operators—plus considerable self-hypnotism—convinced the management that the possibility of the roll stopping on the peak of the cam was about one in a million. They took a chance. They shipped the machine. An operator almost immediately did break his arm. A costly law suit resulted. Beyond all that the new machine got a “black eye” which persisted long after the hazard was eliminated.



# Segregates in Steel

## Analyzed Spectrographically

Special spectrographic techniques are available for studying metal structures of many alloys, particularly the more complex types, and for making a continuous analysis of the variation across a segregate

IN addition to the large variety of routine control applications, the spectrograph is being used to advantage in the analysis of segregates in steel. The method also provides the metallurgist with a means for identification of inclusions in metals.

The quantitative aspect of spectrographic analysis depends upon the fact that characteristic atomic spectrum lines differ in their intensity and it rests upon two suppositions, that other things being equal, the intensity of a spectrum line is governed by the number of luminous atoms in the source of light and that the number of luminous atoms is proportional to the aggregate number of atoms in the sample.

**Localized Spark Used**—How spectrographic methods can be used to study metal structures was discussed by J. Convey, chief, Division of Physical Metallurgy, Bureau of Mines, Ottawa, Canada, in a paper presented before the first regional conference of the

Analytical Chemistry Division of the Chemical Institute of Canada, Ottawa. In earlier tests conducted by Convey on the application of spectrographic methods to the analysis of segregates in steel, a highly localized spark was used for the examination of minute areas (0.31 mm diameter).

Weight of metal consumed in the test was approximately 0.000005-gram and from one exposure of 15 seconds the elements silicon, manganese metal, chromium, molybdenum, and vanadium were estimated. One use of this technique was the examination of a high speed cutting tool, Fig. 1. During heat treatment of these tools the tips had softened and the microstructure shown in the accompanying photomicrograph, Fig. 2, was found to exist in the troughs between the teeth. Spectrographic examination of the tool gave the carbon analysis presented in Table I. This general method also provides the metallurgist

Fig. 1—High speed cutting tool showing location of analyses using a highly localized spark with the spectrographic method. Table I gives carbon content at points tested

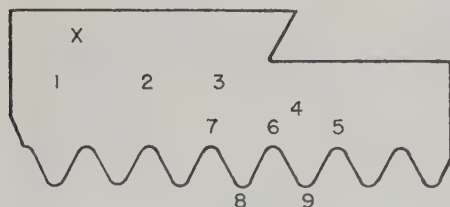
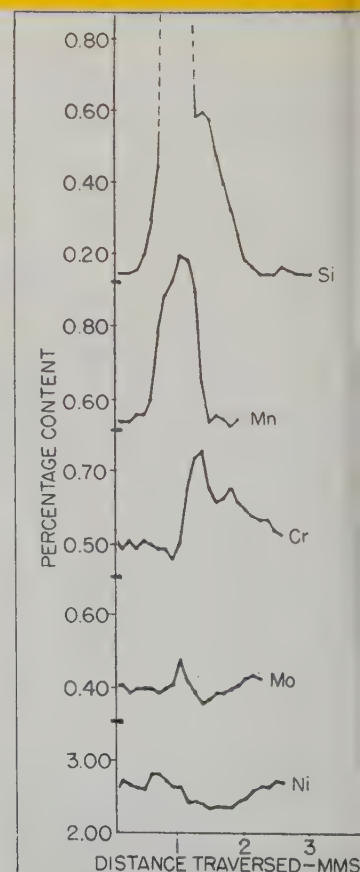


Fig. 2—Microsection of high speed cutting tool at base (trough) of tool



TABLE I		
Exposure	log CIII 2296.8	% Carbon
	Fe 2311.288	
1	0.960—1	0.95
2	0.966—1	0.95
3	0.965—1	0.95
4	0.960—1	0.95
5	0.613—1	3.50
6	0.720—1	3.50
7	0.730—1	3.50
8	0.030	0.65
9	0.021	0.65





with a means for identification of inclusions in metals. Conditions for using the above spark-spot method or analysis of steel aggregates are:

Instrument used	Hilger E. 1 quartz spectrograph
Wave band	2200-3000 Å
Slit width	0.0015 cm.
Distance of electrode from slit	4 in.
Spark gap width	0.015 in.
Voltage	15,000 (open circuit)
Added inductance	nil
Upper electrode	silver rod, (7 mm in dia), nipple-pointed, height of nipple point 0.05 in., angle 36°, oxidized by pre-sparking for 15 sec.
Plate	Kodak Photoscrip B10
Exposure Time	15 sec.

**Circular Segregates**—This technique has also been applied by Convey to the analysis of segregates occurring in large forgings in nickel-chromium-molybdenum and nickel-vanadium steels. In this case, most of the segregates were roughly circular in cross section, having a diameter of approximately 0.04-0.08-inch. Their length, however, was considerably greater and because of this, longitudinal sections were prepared for spectrograph examination.

As the segregates were not visible on polished sections, an etch with Oberhoffer's reagent was used to bring out the segregate with a minimum of attack on the specimen. After etching, a number of separate exposures were made on the segregate and on the normal metal in positions well removed from it.

Table II shows the results of analysis on segregate and nonsegregate sections of the forging. Tests on specimens from large forgings of nickel-chromium-molybdenum and nickel-vanadium steels, showing marked segregation, gave higher values for all elements in the segregates, as compared with the respective values for the matrix of the steel.

**Traverse Spark Technique**—Since critical examination of the results of analysis of steel segregates showed the existence of a variation in element composition within a segregate, a method was developed whereby a continuous analysis of the variation in content across a segregate could be made. The segregates were examined by traversing the samples with a highly localized condensed spark (1 mm/min) while the photographic plate on which the spectrum is recorded moved downward across the camera aperture of the spectrograph (10 mm/min). In this way a spectrogram is obtained on which the spectral lines vary in density over their length according to local changes with composition of the specimen along the path of the spark.

Versatility of the spectrographic method of metal structural analysis using the traverse spark technique is illustrated in Fig. 4, wherein a traverse of 2 cm was recorded. Maximum length of a single traverse using Convey's apparatus is controlled by the rate of fall and size of the photographic plate. However, by careful adjustment of sample and electrode it was found possible to traverse an extreme amount of sample providing the photographic plates maintained a high reproducibility from plate to plate. The dotted lines show the position of the break in the

3 (left)—Analysis across a silicate inclusion in steel using the traverse spark method

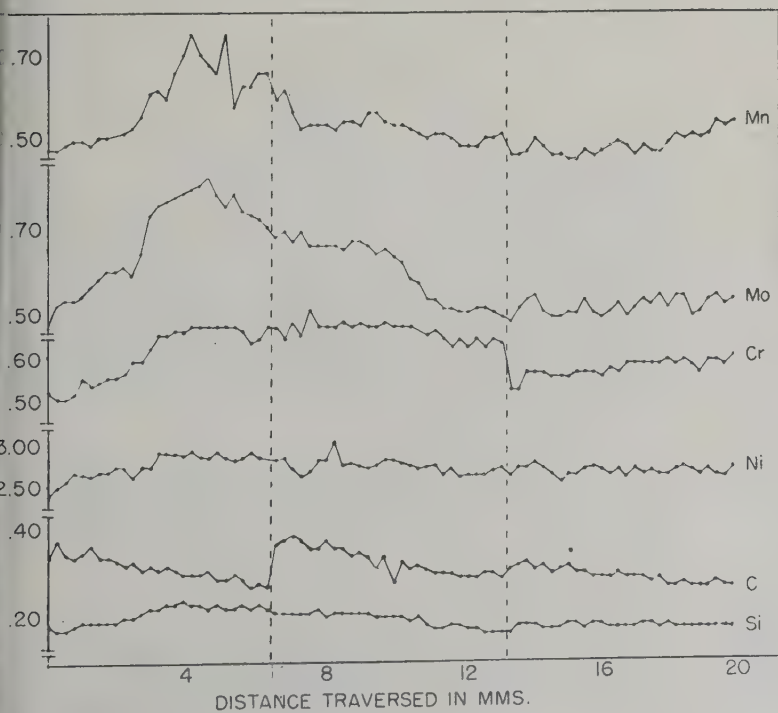
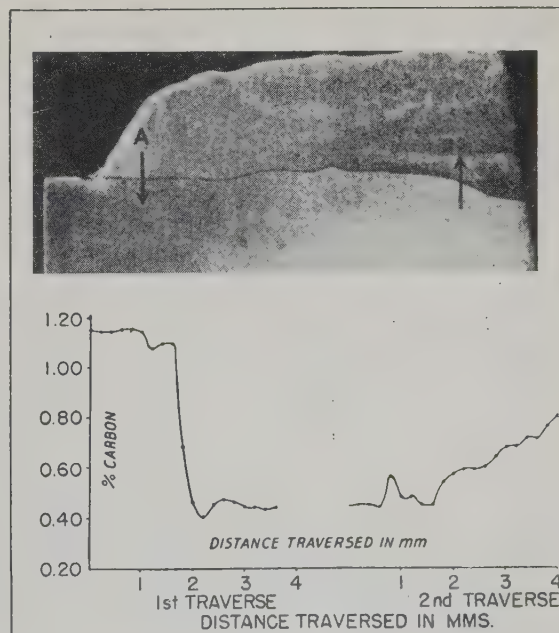


Fig. 4 (left)—Location and triple traverse across a steel segregate  
Fig. 5 (below)—Traverse analysis across a weld





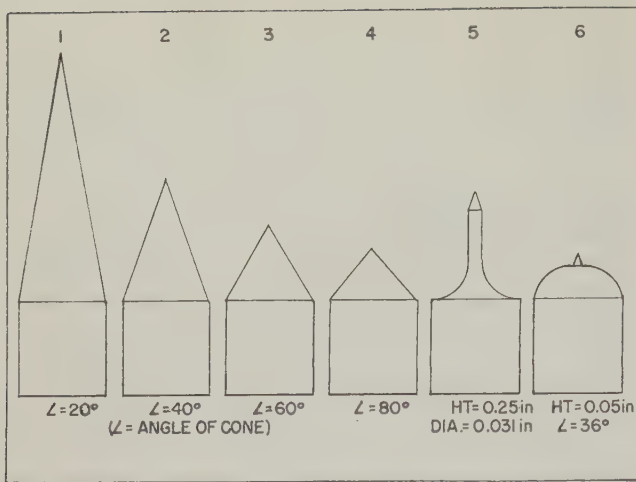


Fig. 6—Shapes of electrode points investigated in tests to obtain reduced sparking area for analysis of segregates. Specimen 6 gave best results

traverse, where the photographic plate was changed and a succeeding traverse commenced. The results show an excellent degree of continuity.

**Curves Plus Micrographs**—Another aspect of the method is its sensitivity with respect to the smallest structural inhomogeneity traversed. It can be seen that the content recorded by the traverse technique, when the traversed section is less than one sparked crater width in size, will be diluted accordingly by the adjacent material. The answer to this problem was obtained by a series of traverses across a wedge-shaped bar (5.5 cm long with a base of 2.5 mm) of nickel-chromium-molybdenum steel clamped between two pieces of mild steel.

From a knowledge of the chemical composition of the two steels and the constants of the method, theoretical content curves were calculated for traverse of the insert wedge bar at various positions along its length. Experimental results corresponded closely to

these calculated values. The tests show that under controlled conditions a measure of the relative content variation within a metal structure can be added to the micrographical observations of the metallurgist. These studies established that the emission from the secondary discharge, which forms a halo around the main crater owing to the primary discharge, is negligible since a sudden change in content is evidenced when the spark traverse crosses the junction of the two steels.

**Applied to Testing Welds**—Experiments conducted on welded structures showed that the special spectrographic method provided a simple method for studying metallic diffusion. Fig. 5 shows the analysis of a welded structure. Failure of this weld always commenced in the area marked A, and the traverse graphs illustrate the lack of carbon diffusion at point A, whereas in the second position, noted by arrow, normal diffusion had occurred.

Earlier work conducted by Convey had shown that to obtain a quantitative analysis of various steels for carbon a higher steady state potential of the spark gap was required. This was produced by blowing a small blast of dried air across the spark gap (pressure, ½-inch of water). The method was standardized and tested. Analyses of segregates were identical with those obtained with the spot-spark and traverse spark techniques without air blast.

## Transmission Reflects High-Rate Precision Manufacturing

THIS month the 3,000,000th Hydramatic production transmission will be delivered by the Detroit Transmission Division of General Motors Corp., marking a milestone in the manufacture of this automatic unit, the design of which was initiated in 1932, seven years before appearance of the first production model. The accomplishment was reviewed by Walter B. Herndon of DTD at a recent symposium on automatic transmissions conducted by the Society of Automotive Engineers at its summer meeting in French Lick, Ind.

Total weight of the transmissions produced in 12 years exceeds 375,000 tons and, installed in automobiles, the line of vehicles would fill a three-lane highway bumper to bumper from Boston to Los Angeles. Beyond that, there have been 85,000 military-type Hydramatic transmissions built for installation in tanks, armored cars and amphibious vehicles.

**A Nonexclusive Device**—Thirteen different models are now in production, eleven for passenger cars and buses, two for military vehicles. Users include Cadillac, Oldsmobile, Pontiac, GM Truck & Coach, GM of Canada, Lincoln, Hudson, Nash and Kaiser-Frazer. Other would-be buyers, in this country and in Europe, have had to be turned down. Current daily output is 3400 units and going up as fast as plant expansion can accommodate it.

Unique feature of the drive is its split-torque arrangement. In high gear, for example, 38 per cent of the engine torque is transmitted through a fluid coupling, while 62 per cent is transmitted to the wheels

TABLE II  
RESULTS OF ANALYSES ON NICKEL-CHROMIUM-MOLYBDENUM STEEL FORGING IN NONSEGREGATE AND SEGREGATE PORTION

Test No.	Silicon %	Manganese %	Nickel %	Chromium %	Molybdenum %
Tests on Nonsegregate					
1	0.15	0.49	2.77	0.65	0.43
2	0.17	0.46	2.68	0.59	0.42
3	0.18	0.50	2.68	0.59	0.44
4	0.17	0.46	2.55	0.55	0.39
5	0.17	0.47	2.75	0.62	0.44
6	0.18	0.46	2.68	0.59	0.43
7	0.17	0.45	2.60	0.56	0.38
8	0.16	0.49	2.65	0.56	0.39
9	0.17	0.47	2.73	0.61	0.42
10	0.17	0.46	2.68	0.58	0.40
Average	0.17	0.47	2.68	0.59	0.41
Greatest deviation from average	+0.01	+0.03	+0.09	+0.06	+0.03
	-0.02	-0.02	-0.13	-0.04	-0.03
Tests on Segregate					
11	0.20	0.47	3.02	0.71	0.88
12	0.21	...	3.07	0.73	0.78
13	0.21	0.66	2.94	0.72	0.63
14	0.21	0.73	2.90	0.68	0.66
15	0.21	0.49	3.78	0.61	0.52
16	0.19	0.53	2.82	0.65	0.53
17	0.19	0.49	2.87	0.62	0.51
18	0.21	0.53	3.00	0.72	0.54
19	0.19	0.50	2.76	0.64	0.55
20	0.21	0.54	3.01	0.75	0.57
Average	0.20	0.55	2.92	0.68	0.62
Greatest deviation from average	+0.01	+0.18	+0.16	+0.07	+0.26
	-0.01	-0.08	-0.16	-0.07	-0.11

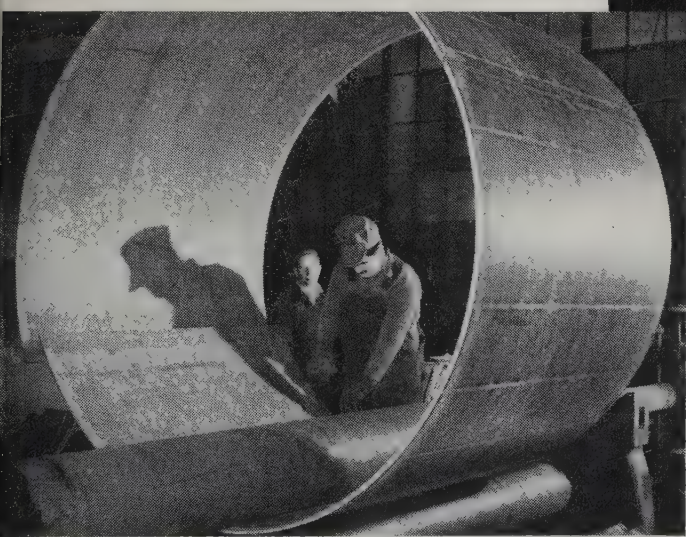




**WELDING HERCULOY** plates into a hot water storage generator for the new Veterans' Hospital in Boston.

**ROLLING HERCULOY** plates into cylindrical form for the tanks. Photos from The Patterson-Kelley Co., Inc., East Stroudsburg, Pa.

Once Again—  
**HERCULOY**  
 is Chosen for Hot Water  
 Storage Generators



**HERCULOY** is Revere's Copper-Silicon Bronze, which has the corrosion resistance of copper plus the strength of mild steel. It is therefore ideal for hot water tanks, among many other applications. Much has gone into domestic water heaters, but these are far outstripped in size by a number of large tanks fabricated of Herculoy by The Patterson-Kelley Co., Inc., East Stroudsburg, Pa., for the new Veterans' Hospital in Boston. The water is heated by steam passing through bundles of Revere Phosphorized Copper Tube. Inlet and outlet flanges are Herculoy, made from heavy gauge extruded shells, which offer economies over the alternative method of cupping them out of plate.

Patterson-Kelley weld all these large storage heaters, using Heliarc. Easy weldability is another important quality of Herculoy. Golden beauty is also a feature, and the size and beauty of these tanks created a great deal of comment while they were being trucked to the hospital. . . . Remember Herculoy's qualities: corrosion resistance of copper, strength of mild steel, easy weldability and formability, and beauty. Remember other applications besides tanks, such as: vats, screens, filters, ducts, fire extinguishers, chemical and marine construction.

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mechanically through hydraulically manipulated planetary gearsets, resulting in negligible slip through the fluid coupling while still realizing the advantages of cushioning engine shock.

Recent design improvement has been the inclusion of a new type of reverse. Previously the reversing action was obtained by manual engagement of a pawl with the reverse gear. Now it is obtained by the hydraulic engagement of a pawl with the reverse gear, the idea being to obtain easier and faster reverse application and to enable rocking the car from forward to reverse in ice, snow or mud.

**Pump Design To Change**—Soon to appear on the Hydramatic is a new variable-capacity vane-type pump. It comprises pump body, regulating slide, rotor and vanes, and the regulating valve, arranged to vary oil pressure output to the momentary requirements of the transmission and to supply a much greater capacity than pumps now used in automatic transmissions. Further benefits expected from the pump are cooler operation through reduction of churning; increased fuel economy; minimized internal leakage because of the higher low-speed capacity, and less operational variance due to temperature change.

An entirely new Hydramatic design recently appeared in connection with a demonstration of the General Motors Research 19xx engine at the Ameri-

can Petroleum Institute meeting in Tulsa (STEEL, May 7, p. 101). At one time it was believed this transmission would appear in the 1951 Cadillac models, but apparently production delays were encountered. To set industry speculation at rest, Mr. Hernon says: "Without going into much detail at this time, we can say that this future Hydramatic approaches the transmission designer's dream of combining into a single package the desirable features of all types of drive. We believe it will set new standards of smoothness, fuel economy, performance and engine braking."

Application of the transmission to commercial vehicles as differentiated from passenger car use is a field which DTD has scarcely touched. While there have been several experimental applications made in trucks with favorable results, according to Mr. Hernon, it has not been possible to furnish them in production quantities because of the heavy demands of passenger car customers. The truck market may be one for cultivation when productive facilities catch up with current demand. Meanwhile the spreading defense program points up possibilities of new adaptations in military equipment where features of operational economy, positive gear ratios, acceleration, downhill braking and widespread service know-how are advantageous.

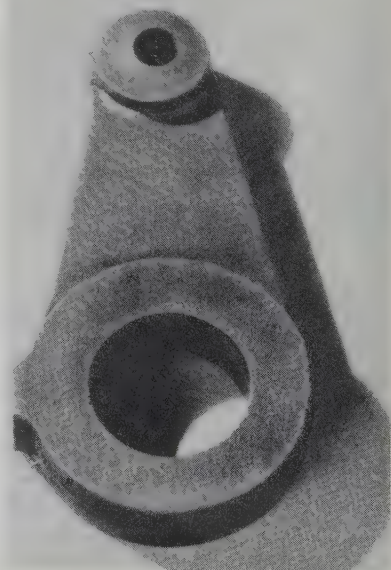
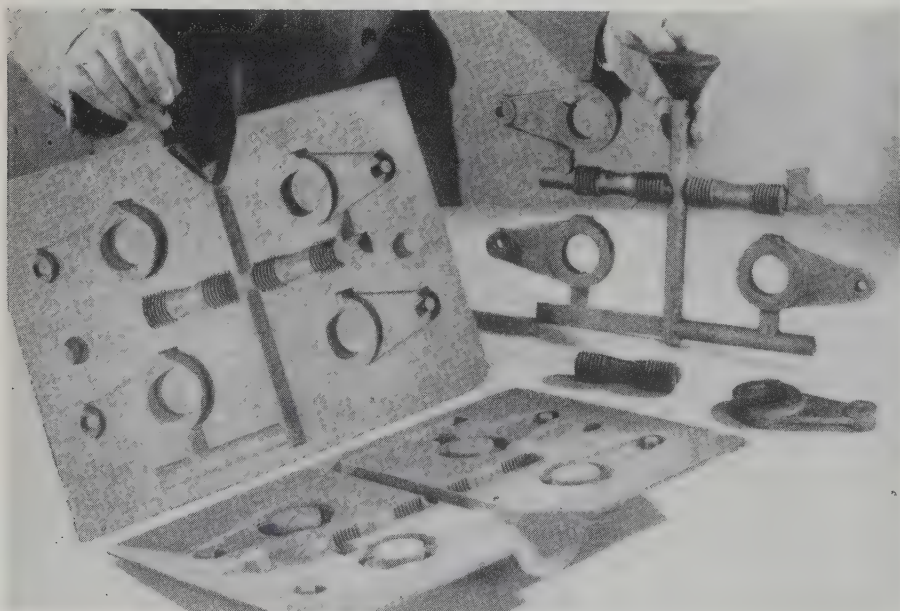
## Shell Molded Parts Are Machined 30% Faster

FROM 30 to 40 per cent of the normal machining time is reported to be saved on production of Meehanite machine parts cast by the shell molding, or Croning process. This technique employs thin, shell-like single-use molds made of sand bonded with Bakelite phenolic resins. The mixture of sand and resins is applied in a thin coating to the surface of a heated metal pattern, then baked hard to form half of a mold.

Clamped together, the two halves of a mold, below,

are placed in a flask, surrounded by steel shot or other suitable bedding material and the metal is cast. Smooth surfaces of the molds produce castings to tolerances of 0.002 to 0.003-inch per inch, drastically reducing the work necessary to finish the piece.

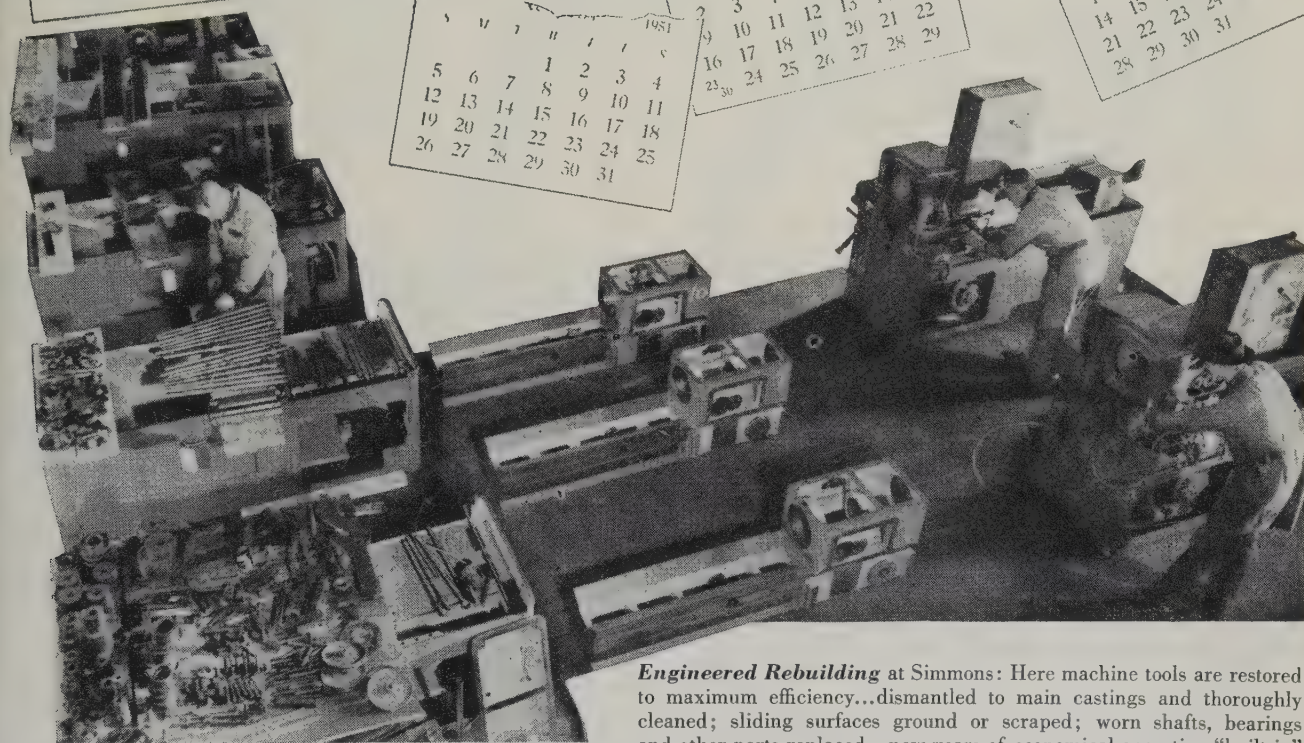
Builders Iron Foundry, Providence, R. I., found that a connecting rod cast by the Croning process and processed in lots of 300, can be drilled, ground and cleaned in almost 30 per cent less machining time than was previously required.





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# COLD ROLLING STRIP

*An appraisal of today's*

*theory and practice*

Practical problems encountered in strip mill operation including wavy edges, breakage at weld, pickup of particles, mill vibration and skidding are explained and remedies for their reduction or elimination are suggested by the author

By J. D. KELLER  
Consulting Engineer and Partner  
Associated Engineers  
Pittsburgh

## PART VI

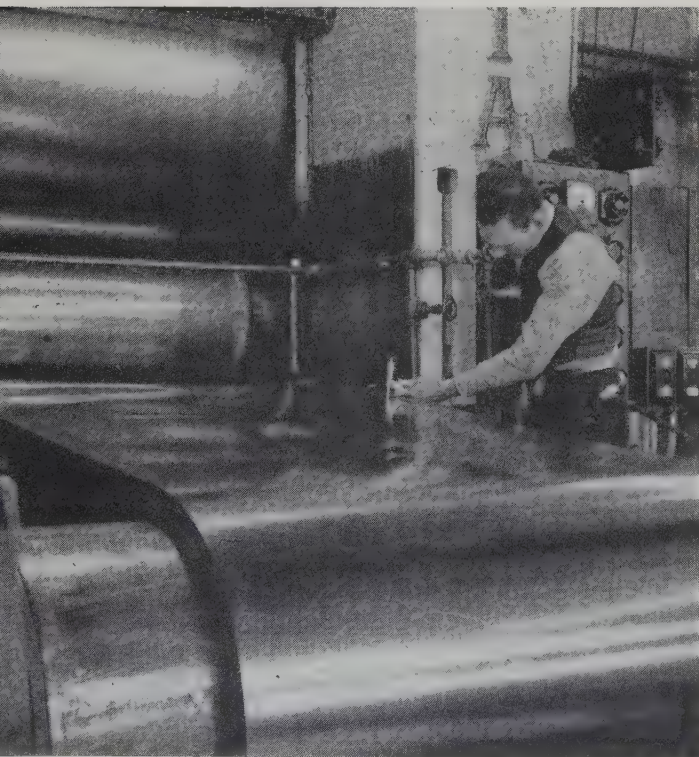
ALTHOUGH tearing and breaking of strip occurs only infrequently, it is probably the greatest single source of loss of production in cold strip mills. It is especially serious in high-speed mills, where strip breakage results in a wreck, causing marking and, later, spalling of the rolls. When breakage of the strip occurs, it is usually in the later passes where the general practice has been to carry a higher tension in pounds per square inch than in the earlier passes, and where also the strip has become more brittle because of work-hardening. The most frequent cause of breakage is some defect in the steel, particularly at the edges of the strip. Small holes can result from tearing-out of particles by adhesion to the rolls in the hot mill, or from pickup of particles on the cold-mill rolls, which particles then punch through the strip. Defects at the edges usually result from dull or

wrongly-set knives in the side-trimming shears preceding the pickler, but can also be caused by excessive rubbing of the strip edges on the guide plates, or from bumping when conveying the coils.

**Why Tension Varies**—A round hole can increase the tensile stress to three times the average, whereas a small tear or crack at right angles to the strip edge can multiply the stress by 10, in brittle materials such as work-hardened strip steel. Edge defects are therefore much more likely to cause strip breakage than those nearer the middle of the strip, hence the strip is often rolled with less tension at the edges than at the middle.

One way of effecting this is to roll the strip with nearly flat cross section or even with a slightly thin center in the early passes, and so regulate the contour of the rolls in the later passes as to reduce the thickness slightly more at the edges than at the middle. If the strip leaving the early passes has a hollow center, the finished strip may be rolled flat, or if the strip is flat when leaving the early passes, the finished strip will be slightly thicker in the middle, as shown (exaggerated) in Fig. 25. The latter contour is preferred for handling reasons. The work rolls in the early passes are given a slight crown, whereas those in the later passes are ground flat or cylindrical. Since, first, the rolls may become slightly hollow from wear, and second, the contour of the entering hot band or strip produced by the hot strip mill varies appreciably from time to time and this may greatly vary the edge tension in the strip, the actual operating contour of the cold mill rolls is controlled by adjusting the distribution of the high-pressure cooling water among the various spray nozzles across the roll face to produce that temperature distribution which will give the contour desired.

**Wavy Edges Are Produced**—In reversing mills, where only two work-rolls take care of all passes and their contour therefore cannot be exactly correct for more than one or two, the difference in reduction be-



Measuring the gage at edge of strip on delivery side of 4-high cold mill





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# MORSE

## Cutting Tools



tween middle and edges of the strip is often carried to the extent of actually producing wavy edges in the strip, thus reducing the edge tension practically to zero. In tandem mills, the difference is much less; it is far from sufficient to produce wavy edges, in fact only enough to reduce the edge tension moderately; and to compensate for this, in recent practice the average tension in pounds per square inch in the later passes is frequently reduced somewhat below the unit tension in the earlier passes.

Aside from the above-described method, it might be possible to increase the tension above the average in the middle and reduce it at the edges of the strip, to a sufficient extent, by so contouring the tensiometer roll that it has a slight crown.

Breakage of the strip can also be caused by defective tension control. Kaufman<sup>28</sup> described a condition in which, particularly during the acceleration period, too much palm oil on the strip caused a loop to form momentarily between stands Nos. 4 and 5 of the tandem mill, corresponding to complete loss of tension. As the mill continued to accelerate, the slack was then taken up rapidly and the resulting jerk frequently caused breakage of the strip. This was remedied mechanically, by avoiding excessive supply and insuring uniform distribution of the palm

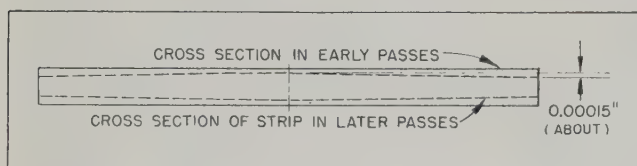


Fig. 25—Diagram (exaggerated) showing greater reduction at edges than at middle of strip, in later passes

oil, and electrically, by decreasing the percentage IR drop compensation on the motors driving the stand preceding the loop and increasing it for the stand following the loop, during the acceleration period.

**Breakage Occurs at Weld**—Strip breakage sometimes results from the welds passing between the rolls at full speed. The front end of each coil coming from the hot mill is welded to the rear end of the preceding coil before the continuous pickler which precedes the cold-reducing mill. The strip after pickling is again cut into separate lengths before recoiling, depending on the size of the coil desired for the cold mill, but it seldom happens that the welds can be cut out. Every effort is made in the grinding or planing following the welding operation to remove all flash and bring the weld down to the exact thickness of the adjacent strip, but even when this is so successful that the presence of the weld can hardly be detected by eye, still the weld metal is both harder and less ductile than the rest of the strip. Actual roll pressure or force measurements have shown a decided increase of force as the weld passes between the rolls, with a severe blow on the strip following the weld<sup>37</sup>, probably due to roll inertia. The momentary increase of tension caused by the smaller reduction of the hard metal at the weld and the blow from

the rolls, may break the strip not at but adjacent to the weld. However, even when the welds are rolled at full speed, according to Powell<sup>27</sup> such breakage occurs in only 3 to 4 per cent of the welds, in the Aliquippa mill.

Slowing down the mill to allow the welds to pass through slowly, besides having the disadvantage of decreasing production, does not always eliminate the breakage, since Stoltz and Brinks found that slowing down from full speed to threading speed caused an increase of tension throughout all passes, due to the previously mentioned increase of gage of the strip. In their tests on the high speed mill at Weirton, the increase ranged from 43 to 88 per cent of the total normal tension, and this increased the tensile stress between Nos. 4 and 5 stands to about 40,000 psi. If coincident with the presence of an edge crack in the strip, this increase of tension could result in breakage.

**Pick-up of Particles Cause Defects**—Operators keep the strip surfaces under constant inspection, but in spite of this, particles adhering to the rolls can cause periodically recurring defects in the surface over a considerable length of strip, in high-speed mills. Such particles may be bits of scale which have been rolled into the surface in the hot mill and loosened but not removed in the continuous pickler; or bits broken off from laminations if these are present in the steel; or, finally, they may be the pieces pulled out of the craters at the places where welding to the roll surface occurs during stick-slip friction, as observed by Bowden and Leben<sup>19</sup> and by Nekervis and Evans.<sup>17</sup> Welding takes place only if the boundary film of lubricant is imperfect, so that actual metal-to-metal contact of strip on rolls occurs at the high spots.

Constant watchfulness, careful pickling and scrubbing, and cleanliness of steel seem to be the only remedies.

**Roughness of Strip Surfaces.** Excessive roughness usually results from laminations or dirt in the steel, but less conspicuous roughness may be caused by roll surfaces which have been roughened by wear or were not initially of sufficient smoothness. Finished strip surfaces are graded as No. 1, which has a root-mean-square roughness of 15 to 30 microinches (millionths of an inch); No. 2, having 5 to 10 microinches, and No. 3, with 1 to 2 microinches. By far the greater part of the strip produced at present has No. 1 surface finish, but the tendency is to increase the proportion of No. 2. Of course, these finishes are produced by the final rolling in the skin pass or temper mill, but the latter cannot eliminate excessive roughness produced in the cold-reducing mill.

For some uses such as hot-dip tinning and especially for enameling, the roll finish in the temper mill is sometimes made such as to open up the surface of the strip in order to permit more effective alloying of the tin with the strip surface, or better adhesion of the enamel. Also in temper mills, the roll surfaces are (or were) sometimes purposely roughened, with the object of reducing or eliminating stretcher strains or Luders' lines in the strip material during later cold-forming.

**Vibration, Shuddering or Chattering of Mill**—This



trouble is not of frequent occurrence, but when it does occur the cause may be difficult to locate, especially since the vibration ordinarily occurs at irregular intervals of seldom more than 15 seconds duration. Stick-slip friction of the strip on the rolls could produce it, either in the form of tangential compression waves traveling around the roll circumference (Rayleigh waves), due to variation of frictional traction; or in the form of transverse vibration of the roll as a whole, due to periodic fluctuation of the radial force resulting from change of the friction hill. The extreme violence of the vibration in high-speed mills would seem to indicate that it is caused by some action involving the total force exerted on the rolls. On the other hand, the transient nature of the vibration points to a resonance effect, which could be produced by comparatively minor forces.

Out-of-roundness or eccentricity of the backup rolls has been shown by oscillograph tests to produce vibration. Friction in the universal joints (poor lubrication or worn slippers), and insufficient clearance in the roller bearings of the work rolls have also been suspected or shown to have been either primary or contributing factors. Too great flexibility (and probably deficient damping) of the tensiometer head has been blamed in one case. In another, insufficiently smooth finish of the rolls seems to have been responsible, because changing to No. 80 grit finish or finer, eliminated the chattering.

In high-speed mills the most probable or most frequent cause of vibrations seems to be either unbalance of the pinions or inaccuracies of the pinion teeth, especially in the last passes where the rolls are "geared up" to a higher speed than the motors. In such mills, even the collection of water or oil in a recess at one side of the pinions has caused sufficient unbalance to produce troublesome vibrations.

**Skidding of Rolls on Strip**—In all except the pull-type mills, the greater part of the energy required for rolling is supplied by transmitting torque through the rolls. If the torque exceeds the product of:

$$\text{Coefficient} \times \text{Roll force} \times \text{Roll radius}$$

then skidding occurs, which is the slipping forward of the roll surface as a whole, relative to the strip surface in the contact area. From this standpoint, it is possible for the coefficient of friction to be too low. Skidding may also be initiated by excessive back tension.

Skidding is undesirable not only because it interferes with control but especially because it produces scratches in the strip surface. Powell<sup>27</sup> and Kaufman<sup>28</sup> found, in the high-speed mill at Aliquippa in which the top and bottom rolls are not geared together and hence the torques could be separately measured, that for equal division of torque the top work roll is more likely to skid than the bottom one, apparently because of better retention of oil on the top of the strip; and that the skidding produced numerous fine scratches of short length, in the strip surfaces. The shortness of the scratches (their length being of the same order as the contact length) indicates that they are caused by metal particles, possibly the high spots torn from the strip by stick-slip friction, adhering to the rolls and carried part

Previous installments of the accompanying treatise have appeared in the February 19, March 5, 19, 26 and May 14 issues and have dealt largely with the theoretical aspects of the subject. The present and succeeding installments treat of the practical aspects.

way into the contact length before they become imbedded in the strip.

Accurate control of the amount of lubricant supplied to the strip, and avoidance of too great back tension, seem to be the remedies for skidding. Recently it has been found that increasing the pressure of the cooling water sprays used on the rolls (for example, from 80 to 150 psi) and properly controlling this pressure, are quite effective means for eliminating scratches and at the same reducing the consumption of palm oil.

(To be continued)

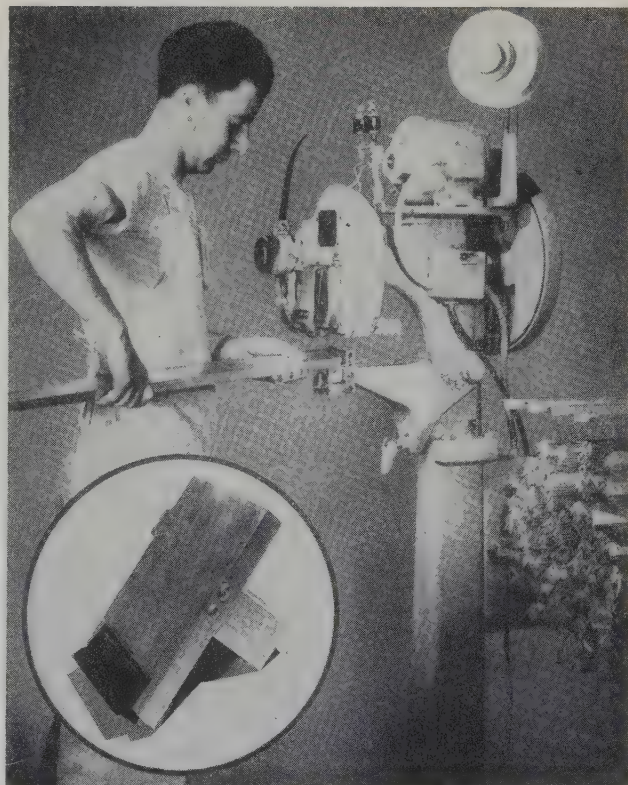
#### REFERENCE

37. G. E. Stoltz and J. W. Brinks, *Iron and Steel Engineer*, October, 1950, pp. 69-77 and discussion pp. 78-88.

#### Correction

Caption for Fig. 13, Part III (STEEL, Mar. 19, p.80) should read: "Decrease of friction with *increase* of number of layers of oil molecules," etc.

## Stitching Cuts Assembly Time



OPERATOR is attaching rubber feet to extruded aluminum ladder legs by use of an Acme-Morrison metal stitcher at Bardwell & McAllister Inc., Burbank, Calif. Metal stitches of 0.051-inch diameter, cold drawn wire are driven through a single layer of aluminum, two layers of rubber and clinched—all in 1/5-second. Total stitch penetration is ¼-inch of rubber and 0.093-inch of aluminum. In comparison with drilling and bolting methods of attachment, stitching reduced assembly time over 85 per cent and cut material costs—less than 1½ cents per 100 stitches





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*STOP outages due to burned and pitted starter contacts.* Life-Linestarter's® exclusive "De-ion®" arc quencher quickly extinguishes destructive arcs. The "De-ion" grid snuffs out arcs . . . contacts last longer.

*STOP outages due to inadequate overload protection.* Life-Linestarter prevents motor burn-out due to overloads. The bimetallic, snap-action, disc type of overload relay shoulders the burden. Precise calibration . . . not affected by aging or oxidation.

Other Life-Line features that will aid you in meeting increased production schedules are covered in "Life-Line Book", B-3842 and "Tomorrow's Starter Today", B-4677. Ask your Westinghouse representative for your copies. Or write to Westinghouse Electric Corporation, P.O. Box 868, Pittsburgh 30, Pennsylvania. J-21642

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*Life-Line*

MOTORS and CONTROLS







This roller-bearing belt conveyor system for stocking-out and reclaiming washed iron ore has a stacker boom of 60-foot radius

## Conveyor Belt Stackers Facilitate Iron Ore Handling

IRON ORE requiring beneficiation is preferably shipped as soon as possible after being processed; however, at times quantities must be stockpiled at the plant when railroad cars are not available for immediate shipment. At the Coleraine, Minn., Canisteo mine of Cleveland-Cliffs Iron Co., two different types of Link-Belt conveyor belt stackers handle this important phase of iron ore production.

One consists of a 30-inch wide troughed belt conveyor mounted on a 60-foot long steel boom, supported in a fixed inclined position from a structural steel tower. Distance from discharge tip of boom to ground is approximately 45 feet. The conveyor belt operates at 440 fpm and is fed washed iron ore of minus 1½-inch size directly from an adjacent washing plant by means of other Link-Belt conveyor equipment.

The system is capable of stocking-out ore at the rate of 300 tons per hour and forming a surge pile of some 8000 long tons of washed ore, ready for re-treating in a heavy density plant.

There is a tunnel under the pile, permitting the ore to be reclaimed to a 42-inch wide heavy-duty roller supported apron feeder-conveyor equipped with a 5-hp P.I.V. variable speed drive. The apron feeder delivers to an inclined belt conveyor for transfer to the heavy density plant.

The other stacker is of the more versatile self-propelled type, traveling on a wide gage railroad track. It has a revolving upper frame equipped with a 100-foot radius boom supporting a 24-inch wide belt conveyor for stockpiling ore in an oblong pile on each side of the track.

**Conveyor Moves With Stacker**—Aside from its self-propelling and revolving features, the stacker has attached to it a 500-foot long, 24-inch wide trailer belt

conveyor mounted on 24-inch diameter single flange car wheels for travel along T-rail tracks with the stacker as it moves ahead.

This traveling, track-mounted arrangement of stacker and trailer belt is fed minus 1½-inch ore from the washing plant by a stationary-mounted belt conveyor which can deliver ore to the trailer belt at any point in its length. This permits the stacker to travel ahead until the trailer belt's foot end has finally reached the discharge end of the feeder-belt from the washing plant.

Consequently, up to 75,000 long tons of ore can be stored on each side of the stacker tracks, with the help of a bulldozer to spread out the pile as required.

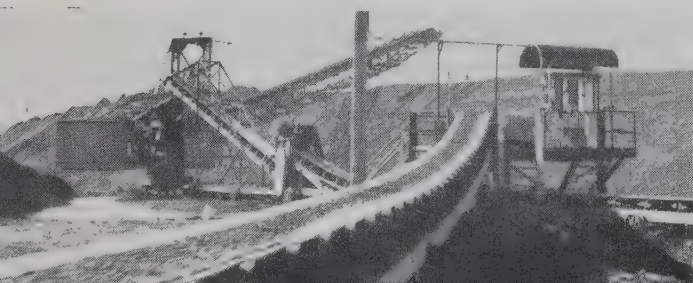
The washed ore weighs 135 pounds per cubic foot and can be stockpiled at the rate of 400 long tons per hour, to a maximum height of approximately 35 feet. The stacker has a maximum swing of 180 degrees and is able to travel and swing simultaneously.

Travel speed, forward or backward, is 15 fpm. The need for traveling is infrequent. Track clamps are provided to secure the machine in position, especially when it is not in use.

This type of traveling stacker makes it possible to stockpile ores of different analyses in separate piles. A crawler shovel is employed for reclaiming the ore from stockpile to railroad cars for shipment.

The Cleveland-Cliffs organization is now installing a similar stacker and trailer conveyor at its Holman-Cliffs mine, Taconite, Minn. It is being equipped with wider gage trucks, a 30-inch wide conveyor belt, and a 110-foot long stacker boom, with capacity to stockpile 600 long tons of ore per hour.

For stockpiling minus 1½-inch washed iron ore at the rate of 400 long tons per hour, Cleveland-Cliffs uses this roller-bearing conveyor system having a 100-foot radius traveling stacker and a 500-foot long trailing belt conveyor section mounted on T-rail tracks. Feed conveyor in left foreground extends from the washing plant and is mounted on stationary supports. Control platform at junction of feed and trailer conveyors is seen at right





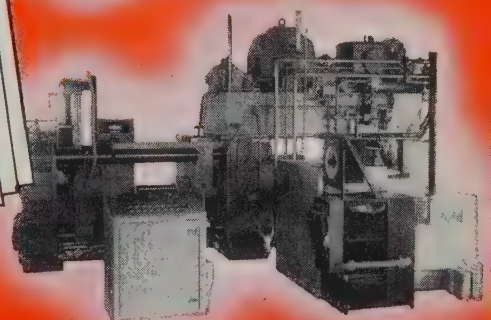
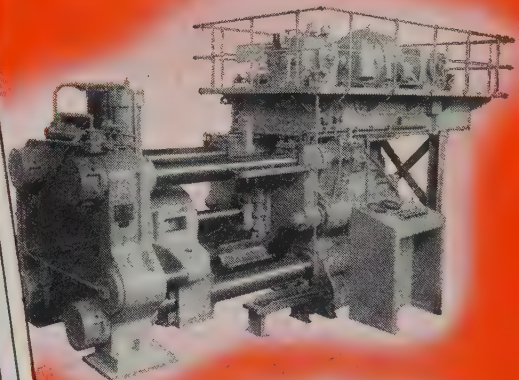
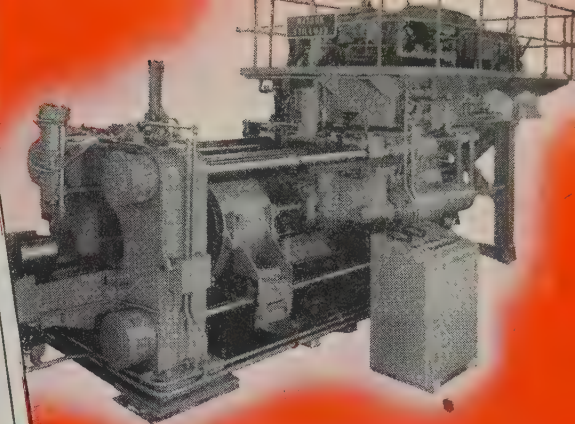
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COMPLETE LINE OF HYDRAULICS THE SHORTEST DISTANCE FROM PRODUCTION TO PROFIT



# Extruded and Drawn Steel Cartridge Cases Approaching Standardization

(Continued from Page 76)

presses would have to be removed and stored at a cost approximating the installation. The latter would be saved if installed in an Army plant and the maintenance cost would be no more than if the presses were stored in a warehouse or if the private plant were leased and protection and maintenance of the equipment paid for. All joint and Army-only plants would be contractor-operated.

In addition to the development of manufacturing methods aimed specifically for use in the standby plants, the Army is currently conducting other projects on steel cartridge cases. Two contracts have been let on steel 20mm cartridge cases. One is with the Stoner Mfg. Co., Aurora, Ill., covering a process of cold extrusion from low carbon steel bar stock. In this process a deep cup is backward extruded from a hot forged slug, followed by one forward extrusion and one conventional draw.

Another is with Proctor Electric Co., Philadelphia, covering the conventional process of cupping and drawing from medium carbon steel plate. The latter company was one of the most successful manufacturers of that case during the war. Just at the end of the war it had produced an experimental lot which embodied all its wartime experiences. However, it had not been ballistically tested. Recently, with the aid of the company, 200 cases from the lot were ballistically tested at 112 per cent chamber pressure without malfunction.

A novel feature of the Proctor development is the forming of the extractor groove in the head of the case by pinching or working it cold instead of by machining. This has overcome flange fractures particularly at subzero temperature firings. Both companies have had successful results in ballistic tests of pilot lots and the development work is nearing completion.

**105mm Cold Extruded**—A contract has been completed with the Heintz Mfg. Co., Philadelphia, covering a process of cold extruding from bar stock the 105mm howitzer steel cartridge case. Ballistic tests have shown the case to be satisfactory.

During the war, most steel cartridge cases were made from plate by the disk, cup and draw method—the method used for making brass cart-

ridge cases. Some work was done in the substitution of a hot forged cup for the cup made from a disk. The hot forged cup was made from bar.

The advantage of using bar instead of plate is in the reduction of the amount of steel required. Twice as many cartridge cases can be made from an ingot of steel if bar is used instead of plate. Yield from ingot to bar averages about 78 per cent; from ingot to plate about 60 to 65 per cent. Yield from plate to round disk is about 71½ per cent and from ingot to disk about 32 per cent. By careful blanking this can be increased to about 44 per cent.

Loss in making the case from bar stock depends on the method of cutoff (saw or shear). Process losses consisting of intermediate and final trims and head machining are no different than for cases drawn from disks. The use of hexagonal instead of round disks reduces the amount of blanking scrap by almost 20 per cent. However, that saving was practically all lost in trimming operations in past tests of hexagonal disks. Proctor Electric Co., in its work on the 20mm steel case, is again investigating the hexagonal disk by attempting to

shape the hexagon into a round before the cupping operation.

**Press Operations Cut**—The number of press operations required to draw the 105mm howitzer cartridge cases from a steel disk during World War II varied from eight to ten. This was reduced to seven press operations from bar by cold extrusion in the first successful attempt, and it undoubtedly can be further reduced by one operation. A hot forged cup generally replaces the first two press operations from a disk. The cold extrusion process generally replaces all press operations except final drawing, head and taper. It is generally necessary to machine the outside of a hot forged cup to obtain the necessary concentricity or uniformity of wall thickness as well as the desired surface finish, which are required in the subsequent drawing operations. No machining is required for cold extrusion.

Cold extrusion involves the use of punches and dies, but it differs basically from drawing. In the latter operation the case is formed by pushing the disk and subsequent cups through dies producing tensile stresses; cold extrusion forms the case by compressing the bar and subsequent cups in dies causing a flow of the steel.

Depending upon the operation and design of punches and dies, the metal can be caused to flow over the punch, i.e., in an opposite direction to that of the travel of the punch. It is a typical piercing operation. This is generally termed backward extrusion and the die is generally of a solid bottom type. In the other type known generally as forward extrusion the metal is caused to flow in the same direction as that of the travel of the punch.

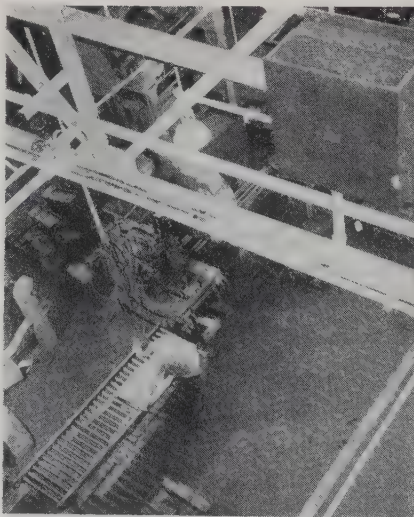
For cartridge cases the first step from the cutoff bar is a preforming or sizing operation; the second is backward extruding into a cup, followed by one or two forward extrusions; then a conventional draw, head and taper.

It may be desirable in some cases and it is practicable to substitute a hot forged cup for the first two cold extruding operations, i.e., the preforming and backward extrusion operations.

In the conventional cup and draw process the disk is generally spheroidized annealed—a time-consuming and expensive operation. A conventional annealing or normalizing only is required for extruding.

**Mechanical or Hydraulic Presses**—Presses for cold extrusion may be either mechanical or hydraulic. Sometimes it is desirable that both types

## Packaged Power for Small Uses



**PUNCH-PRESS** motor at Westinghouse Electric Corp.'s plant in Beaver, Pa., is supplied direct current by a truss-mounted 3-hp selenium rectifier. Small total load from scattered dc machine tools does not warrant use of motor generator sets and distribution feeders. Rectifier gives plant a quick and economical dc supply as the ac side is plugged into adjacent bus duct



be used in one line. Long stroke presses with large shut heights are required. In cold extrusion—both backward and forward types—the workpiece must be withdrawn from the die. In cold drawing the workpiece is pushed entirely through the die. Therefore in extrusion the stroke of the ram must be great enough for the working portion plus the length of the finished extrusion and the necessary additional clearances for convenient placing of workpiece in the die and its withdrawal. Actual working portion of the punch stroke is relatively small for the length of the resultant extrusion.

In backward extrusion the length of the workpiece is about double the stroke. In forward extrusion the workpiece increases in length three or more times the length of the working stroke, depending upon the proportions of the cup to be extruded. In both forward and backward extrusions, power knockouts are required, the ejection force being approximately 10 per cent of the press tonnage.

Continuous movement of the punch during the working portion of the stroke is necessary. Therefore in hydraulic presses some bonus of pump or accumulator capacity must be provided to minimize "chugging" or intermittent movement of the punch. Such action shows up in visible bands around the extrusion with varying physical characteristics of the surface skin structure.

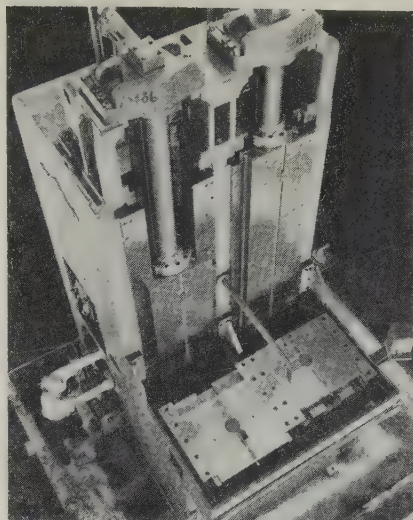
**Experience Limited**—Whether continuous power throughout the work stroke such as is obtained with a hydraulic press or a rack type mechanical press is preferable to varying power such as is obtained with a crank type mechanical press has not yet been thoroughly explored. Neither can authentic data on ram speed—whether constant speed or variation in speed during working stroke—be specified by virtue of lack of exhaustive tests and experience.

Impact, expected more in mechanical than in hydraulic presses is not harmful to the extrusion, but is hard on the tools.

There appears to be no limit as to the speed of application of the punch in extrusion, but the faster the extrusion the more heat is generated. The extruded metal flows out of the die ahead of the punch in forward extrusion at a greater speed than that of the punch, this being proportional to the reduction in cross-sectional area of the workpiece and from two to five times as fast.

**Surface Preparation Important**—Preparation of the surface of the workpiece and its lubrication are important in cold extrusion. The work-

## Broaching Machine for Big Jobs



**GIANT** broaching machine being built by Colonial Broach Co., Detroit, to expedite production of parts for the defense effort ranks among the biggest vertical broaching machines ever built. Overall height is 28½ feet and the dual ram, capable of continuous automatic operation, has a 90-inch stroke for both rams. This feature permits completion of the particular operation for which it is intended in one stroke rather than by two separate operations and machines

piece is given a heavy crystalline metal phosphate coating and impregnated with a high pressure draw lubricant. This operation must be repeated throughout the sequence of extrusions when it is damaged or removed by punch and die wear and by the annealing operations. Lubrication reduces friction on the tools. However, the power required to overcome friction is wasted and the effort should be confined to proper punch and die design to eliminate friction and use the power for the useful purpose of extruding.

Design of punches and dies is probably the most critical consideration. Steel can be extruded with relatively low pressures providing the punch is proportioned to apply its power for flowing the metal instead of overcoming friction, and the die is shaped to avoid friction. The tools naturally must be designed so the pressure used will not cause stresses beyond the yield strength of the punch or die; therefore the highest yield strength steel available should be used. The tools should be designed to permit the displaced metal of the workpiece to flow away from and not contact the punch and die except at substantially a line or point of working contact.

**Uses Low Carbon Steels**—One of

the benefits of extrusion is in obtaining high physical properties in the workpiece with the use of low carbon steels which are generally not suitable for heat treatment to obtain high physicals. Physical properties can be increased as much as three to five or more times that of the original blank. The punch and die design must consider the physical properties that are required throughout the finished piece.

When annealing is required for a subsequent operation, any previous physical properties obtained through cold working are thereby reduced. The forces applied by the cold extrusion operations must not set up stresses in the workpiece beyond the ultimate strength of the material extruded.

In a cartridge case it may be desirable to change the direction of the grain lines at the flange to lessen the chances of shearing the flange by the extractor of the gun. This can readily be accomplished in either extrusion or conventional draw by suitable tool design and perhaps an extra operation.

A final low temperature stress relief anneal should be given steel cartridge cases whether made by extrusion or by conventional cup and draw. This not only relieves any locked-up strains but actually improves the physical properties.

Two methods of protecting steel cartridge cases from corrosion are standard. One is the use of phenol-formaldehyde varnish, baked on, and the other is zinc plate, chromac treated. Both are equally effective and some tests have shown them to be superior in corrosion resistance to brass cartridge cases. The varnish is favored, since no critical materials are involved. Further, the varnished case is easier to extract from the gun after firing because of its favorable friction coefficient.

**Case Design Studied**—Since the manufacture of steel cartridge cases is inherently difficult and requires the use of heavy, long stroke presses, not common in industry, studies are being made of cartridge case designs to overcome these deficiencies. For example, it has been felt for a long time that the recoilless gun cartridge cases could be made essentially by using a preperforated sheet of steel, wrapping it into a cylindrical shape and fastening the lap by welding, brazing or other means, then fastening it similarly to a head piece. This multipiece design is now being developed by several commercial concerns.

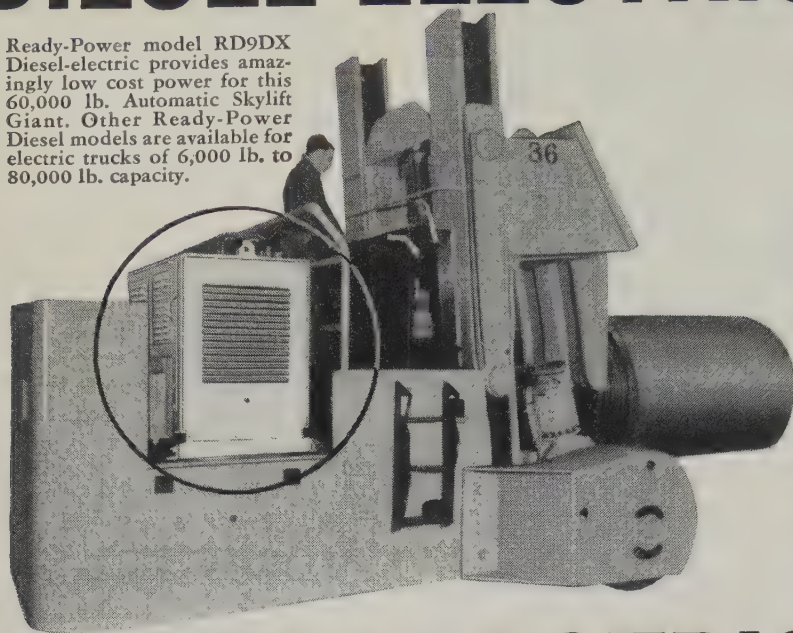
Frankford Arsenal is also investigating means to develop a multipiece design for low power weapons, 75mm

03746



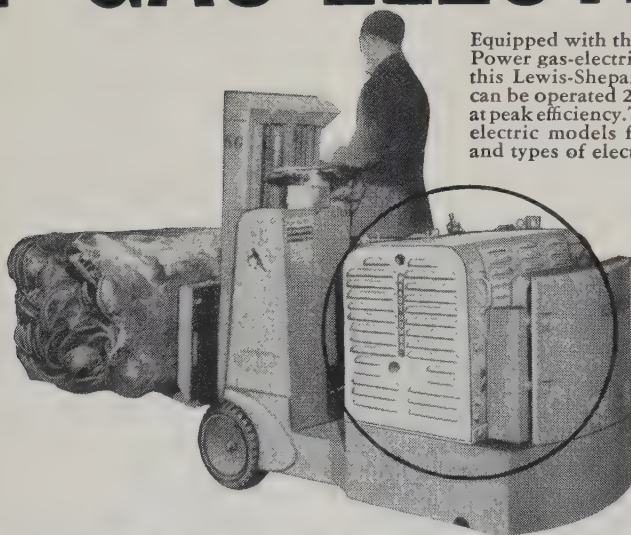
# DIESEL-ELECTRIC

Ready-Power model RD9DX Diesel-electric provides amazingly low cost power for this 60,000 lb. Automatic Skylift Giant. Other Ready-Power Diesel models are available for electric trucks of 6,000 lb. to 80,000 lb. capacity.



# or GAS-ELECTRIC

Equipped with the new Ready-Power gas-electric model H-A, this Lewis-Shepard fork truck can be operated 24 hours a day at peak efficiency. There are gas-electric models for all makes and types of electric trucks.



# READY-POWER UNITS

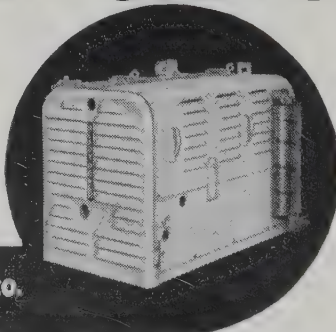
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and 105mm howitzers. A promising design comprises a spirally wrapped overlapping strip steel body portion mechanically attached to a metal headpiece. The joint in the wrapped body portion is unfastened, permitting it to expand when fired, then to contract and easily extract from the gun chamber.

To prepare further for a shortage of presses suitable for cartridge case manufacture over those now in War Reserve, the following steps have been taken:

(1) A survey was made of Army and Navy facilities which made cases during the war for location of any presses still in their possession and knowledge of where they may be located.

(2) A survey was made by the Used Machinery Dealers Association for location of any presses now on the used machinery market or knowledge of the location of any that were sold by such dealers.

(3) Agreement was reached with the Air Force to transfer to Army Ordnance reserve 33 cartridge case presses that were obtained after the war and placed in Air Force reserves.

**Fewer Contractors** — Mobilization plans are based upon a much smaller number of contractors than were used during World War II. In general, attempt will be made to assign each potential contractor two or more calibers or types of cases. This plan recognizes the fluidity of changing requirements in war and is intended to allow the shifting of trained manpower between lines as requirements change.

The Navy submitted a list of 12 contractors to which they propose to limit their planning for procurement of cases larger than 20mm. At least eight of these facilities will be shared between the two services. If possible, the Army will add not more than eight facilities to this list. Mobilization assignments are not yet completed.

The chart on Page 76 reveals that during the war we were in production of steel cartridge cases of practically all models. As can also be seen from the black borders on the second column from the left, only a few models were good enough to keep after the war was over. The two notable exceptions were the 40mm and 3-inch A.A., both of which were accepted as the full equal of their brass counterparts. However, procurement responsibility of the 40mm has been transferred to the Navy and the satisfactoryness of the 3-inch is limited since the gun is now obsolete.

Besides manufacturing difficulties we are confronted with a fundamental



prejudice or resistance to steel as a cartridge case material on the part of the using services. This can be appreciated, for the steel cases supplied during the war were in most calibers definitely inferior in performance to brass cases. This feeling still exists as evidenced by current experience attempting to standardize a steel case for the 75mm howitzer.

It is therefore essential that all steel cases submitted for adoption must be superior to brass, so that the services will have no resistance to their use. Current efforts are along that line.

### Master X-Ray Inspection

Commercial development of xeroradiography—a new process that may greatly reduce the use of films and darkrooms in industrial x-ray work—is the object of a joint program just launched by three organizations: Haloid Co., Rochester, N. Y., Battelle Memorial Institute, Columbus, O. and General Electric X-Ray Corp., Milwaukee.

Xeroradiography is expected to make x-ray inspection faster and more economical so that it can be utilized in many more industrial fields for the first time, particularly in smaller foundries, machine shops, general metalworking firms and many other types of plants. It may also provide a tool of considerable value in the inspection of ordnance and other war material, and has possibilities for application in the field of medical diagnosis.

Xeroradiography (pronounced "Zeroradiography") is a fast, low-cost, dry, direct-positive process for producing x-ray images. It is electrostatic, rather than chemical in nature. Reusable plates and low-cost powders take the place of chemicals and films used in conventional radiography. In less than 2 minutes, with a minimum of effort, an industrial inspector would secure a "shadow" picture similar to that on an x-ray negative, showing the internal condition of his product.

### Novel Vibration Testing Rig

A unique high-temperature vibration testing rig has been set up at the Union, N. J., plant of Elastic Stop Nut Corp. of America for testing critical vibration requirements of stop nuts, especially those used in aircraft manufacture.

These various types of stop nuts must be designed to operate also at sub-arctic temperatures—whether be-

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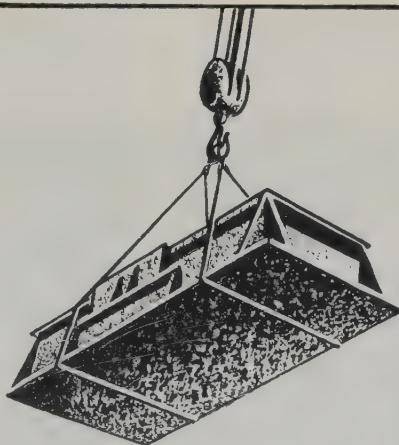
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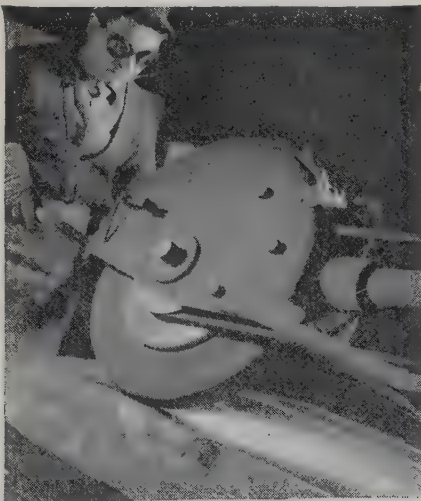
## Can YOU Answer These Questions?

- What are the three types of bonds commonly used in wheels for portable grinders?
- When should you use organic bonded wheels in preference to vitrified bonded?
- How does the pressure exerted between wheel and work affect the choice of grade?
- What special precautions are needed when grinding magnesium?
- How can discoloration be avoided when roughing down stainless steel?

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cause of aircraft altitude or geographical weather conditions. The testing rig is therefore so constructed that it can provide ambient temperatures ranging from sub-arctic to 2000 degrees F. The top range is especially significant in view of the extremely high temperatures at which turbo-jets operate.

The unit permits them to determine whether or not self-locking nuts being developed can ultimately pass existing or proposed Army-Navy test specifications. The rig's flexibility is such that it can simulate condi-

tions more severe than the normal vibration encountered in piston and jet engine operations. At the same time, the machine also allows rigid testing of products before they go into mass production.

The test unit consists of a cam-operated hammer mechanism that produces the required vibrations by both electrical and mechanical means. The drive is furnished by a variable drive motor and speed ranger that is capable of speeds from 590 to 4700 rpm. It is usually run at 2760 rpm and has a range of 8 to 1.

## CALENDAR OF MEETINGS

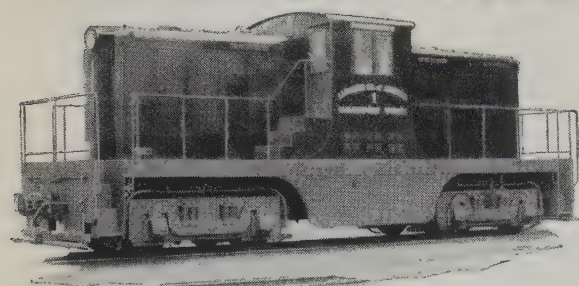
† Denotes first listing in this column.

July 13-14, **Truck-Trailer Manufacturers Association Inc.:** Summer meeting, Edgewater Beach Hotel, Chicago. Association address: 1024 National Press Bldg., Washington 4.

July 23-27, **American Association for the Advancement of Science:** Annual Gordon Research Conference on Corrosion, New London, N. H. Conference director's address: Dr. W. George Parks, Rhode Island State University, Providence, R. I.

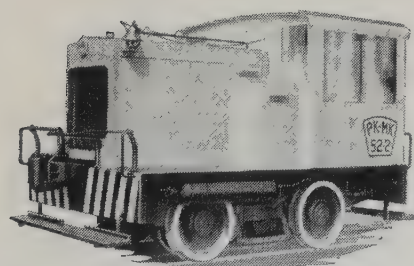
July 30-Aug. 2, **American Electroplaters' Society:** Annual convention, Statler Hotel, Buffalo. Society address: P.O. Box 168, Jenkintown, Pa.

## Because RAIL HAULAGE COSTS

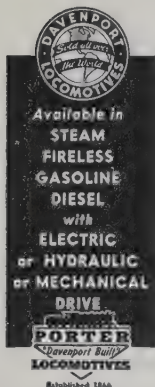


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No two industrial haulage operations are identical. For that reason it is wise to choose a locomotive designed for the particular job on which it is intended to perform. Grades, curves and condition of track; size, number and condition of cars; length and frequency of hauls—these and other factors should be considered in the selection of the rail power unit which will deliver the **BEST RESULTS**—lowest costs per ton mile.

### May We ANALYZE and Recommend?

It will be a pleasure to receive a description of your haulage conditions and work to be done. Our engineers will study your problem and recommend the size and type of locomotive that will assure maximum work at minimum expense. Such recommendation will not obligate you in the least.

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### New Copper Alloy Developed

American Brass Co., Waterbury Conn., has developed Formbrite copper alloy sheet, strip, wire, rod and tube. An unusual combination of physical and fabricating qualities are claimed for the process. Manufacture involves a special procedure of rolling or drawing an annealing brass containing 63 to 90 per cent copper to obtain exceptionally fine grain-size (about 0.008 mm).

Physically the metal is reported to be stronger, harder and "springier" than ordinary drawing brass, yet retains remarkable ductility for deep drawing, forming and cold upsetting. Its harder surface tends to resist abrasion and scratching.

Fine grain structure is said to provide metal with a surface so smooth that a simple buffing operation produces a lustrous finish. Many reports from the field indicate that where parts are to be plated, or even buffed and lacquered, the material effects substantial savings in finishing costs.

Sheet and strip manufactured by this method is offered for practically all drawing brass and purposes. Because of its initial high strength and stiffness, cold fabricated parts acquire added strength and stiffness and frequently can be made of thinner metal than if the usual deep drawing brass were used.

### 90-Ton Reheat Furnace for J&L

A two-zone reheating furnace, equipped to burn heavy oil or coke oven gas, will be installed at Jones and Laughlin's new South Side Works bar mill, Pittsburgh. Rated capacity will be 90 tons per hour, inside furnace width 33 feet, with an effective hearth length of 60 feet. It will be built by Salem Engineering Division, Salem-Brosius, Salem, O.

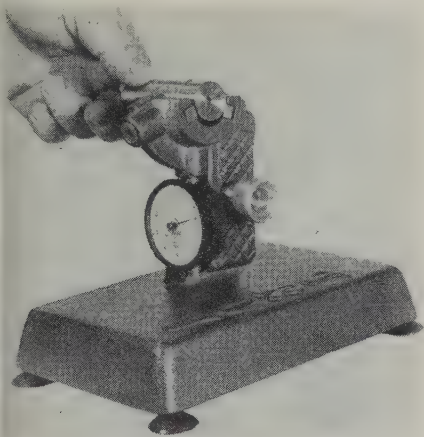


# New Products and Equipment

## Three-Point Gage Accuracy

Troy Precision Tool Co., P. O. Box 52-39, Welshfield, O., is making available a line of comparator gages featuring three-point controlled accuracy. Rotation of a shaft on a gage automatically effects inspection for out-of-round characteristics or cloverleaf, common in shaft finishing operations. Gages are accurate to within 0.0000250-inch.

Series AO open comparator type gages are available in a series of 21



sizes covering the range from  $\frac{3}{8}$  to  $\frac{3}{4}$ -inch in  $\frac{3}{16}$ -inch increments and from  $\frac{3}{4}$  to 6 inches in increments of  $\frac{1}{4}$ -inch. Each gage is adjustable within its range and can be set by means of hardened, ground and lapped setting masters having accuracy to any desired class of tolerance. Compensation is made in the gages to provide direct reading of shaft diameter, even though it is not measured on a 180 degree plane.

Check No. 1 on Reply Card for more Details

## Positive Load Control

A torque converter, antifricition bearing and air operated, contracting type tandem brake clutches give positive load controls to hoists designated the Iron Workers' Special built by American Hoist & Derrick Co., St. Paul, Minn. Brake linkage between foot pedals and contracting bands is antifricition bearing mounted for easy operation. It is basically a two drum hoist but a third drum and derrick swinger can be added if desired.

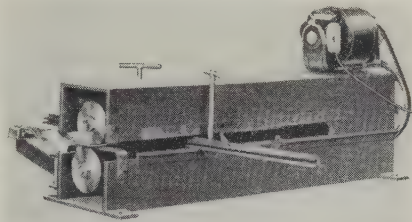
Safety features include a back-up brake that engages automatically on reversal of the drive shaft, ratchet rings of forged steel with compression type dogs and overload regulating air valves which permit clutch slippage in case loads become snagged or hung up while being hoisted. Three

models are available with single line pulls of 14,000, 18,000 and 25,000 pounds.

Check No. 2 on Reply Card for more Details

## Slitters for Small Jobs

Model 2024 or 1624 metal slitting machines introduced by Wilder Mfg. Co., Carmel Valley Route, Monterey, Calif., handle up to 16 or 20 gage mild



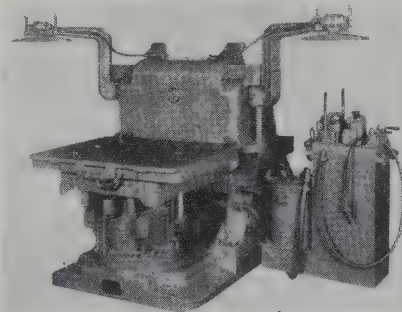
steel depending on the model selected. Possible applications are on sheet or coils for gutter, flashings, downspouts, etc.

In ripping lighter gages it is possible to cut two or more sheets at a time thereby doubling and tripling shop output. Throat depth of 27 inches permits cut to the center of a 4-foot sheet of any length.

Check No. 3 on Reply Card for more Details

## Pattern-Draw Machine

Spo Inc., 6494 Grand Division Ave., Cleveland 25, O., announces a model No. 507 jolt rock-over pattern-draw machine. It has a 1500-pound jolt capacity on 80 psi line pressure and a 10 to 20-inch pattern draw stroke. Rock-over table is automatically



locked in both jolt and pattern-draw position by means of the rock-over air cylinders which prevent it from slapping when being jolted or springing during the draw operation. Two air-operated diaphragm type flask clamps hold flask and bottom board securely against the table during the rock-over.

Having open ends the model can

handle flasks of any length and up to 32 inches wide. Maximum flask space is 24 inches and minimum 16 inches. It is equipped with an automatic air line lubricator, lubrication fittings and two integrally mounted  $1\frac{1}{4}$ -inch air vibrators.

Check No. 4 on Reply Card for more Details

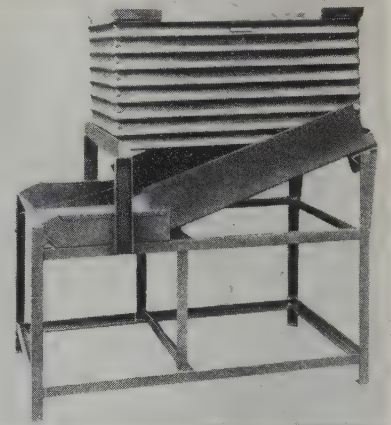
## Fire Hazards Eliminated

A closed hydraulic system using either soluble or nonflammable oil instead of hydraulic oil eliminates fire hazards on the shot end of the improved Cast-Master die casting machines made by Miller-Taylor Tool Co., 5005 Euclid Ave., Cleveland, O. Coupled with this safety telescopic fluid transmission assemblies to hydraulic ejection die lock and shot cylinder have been substituted for hose and flexible piping.

Check No. 5 on Reply Card for more Details

## Precision Dumping Featured

A dump bottom box developed by Union Metal Mfg. Co., Canton 5, O., permits precision dumping with virtually complete spillage control. When used with the company's positioning



stand it makes possible continuous availability of parts in process at their point of use and at convenient work level. Load is discharged by raising the rear end of the box rather than lowering the lift forks, enabling load to be discharged completely at precisely the height and location desired. Dumping is actuated by means of a hydraulic dumping attachment jointly developed by Union Metal and Clark Equipment Co.

Accompanying photograph shows how box discharges its load into a reservoir tray integral with positioning stand. This means a working sup-

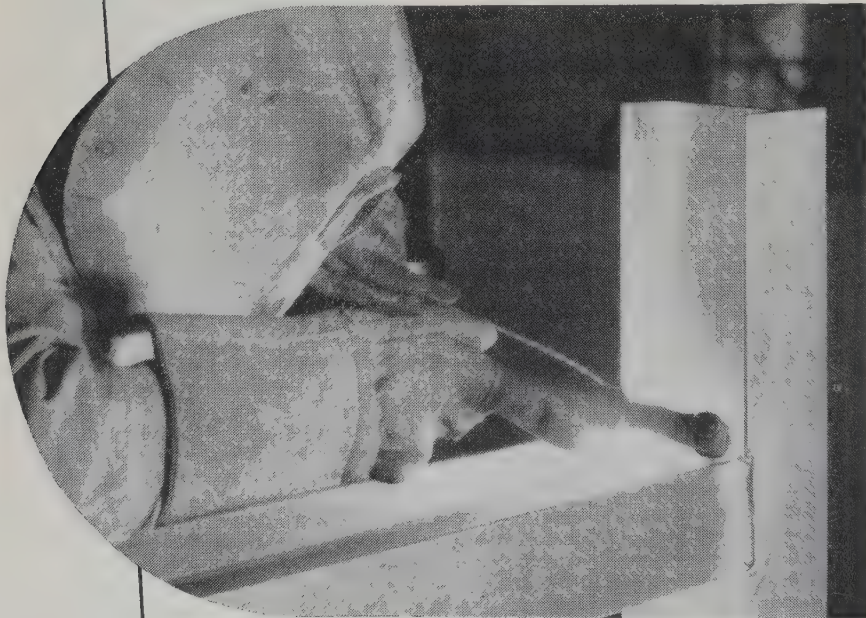


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ply of parts remains during the interval involved in replacing the empty box with a full one. Replacement operation is simplified by the fact that the lift truck forks may be inserted from either side or the back of the box. When box is placed on stand the box bottom descends forming a discharge chute as the truck forks are lowered.

Check No. 6 on Reply Card for more Details

### Inductrols Redesigned

A redesigned line of single-phase Inductrols in standard ratings of 9.6 to 24 kva is announced by General Electric Co.'s Transformer & Allied Product Divisions, Schenectady 5, N. Y. They are available for single-



phase circuits, 600 v and below up to 1000 amperes.

With standard controls, the unit can be used for secondary circuit regulation for light and power supplied from the same line. It can also be used in laboratories for controlling voltage in calibrating and testing meters, instruments and instrument transformers; also operating resistance and induction furnaces.

Check No. 7 on Reply Card for more Details

### Small Capacity Hoist

An addition to its line of hoists is announced by Wright Hoist Division, American Chain & Cable Co. Inc., York, Pa. The Wright Safeway Army type trolley hoist is made in capacities from  $\frac{1}{2}$  to 3 tons and is available with a special load bar and either a pair of two-wheel plain trolleys or one plain and one geared two-wheel trolley.

Plain trolley assembly has chilled tread wheels equipped with ball bearings, steel side plate and connections to load bar. It is adjustable for a wide range of beam sizes and can be changed from plain to geared or vice



# MACK TRUCKS

## See You Through

• There are many good reasons why a Mack is your best truck investment during times like the present. Most important of all is the undisputed fact that Mack trucks outlast them all.

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Thousands of truck users in World War II found out by actual experience that they were indeed "Lucky to own a Mack." Whatever the future may bring, you'll find that for a sound investment in long-term reliability and operating economy there's no other truck to match a Mack.

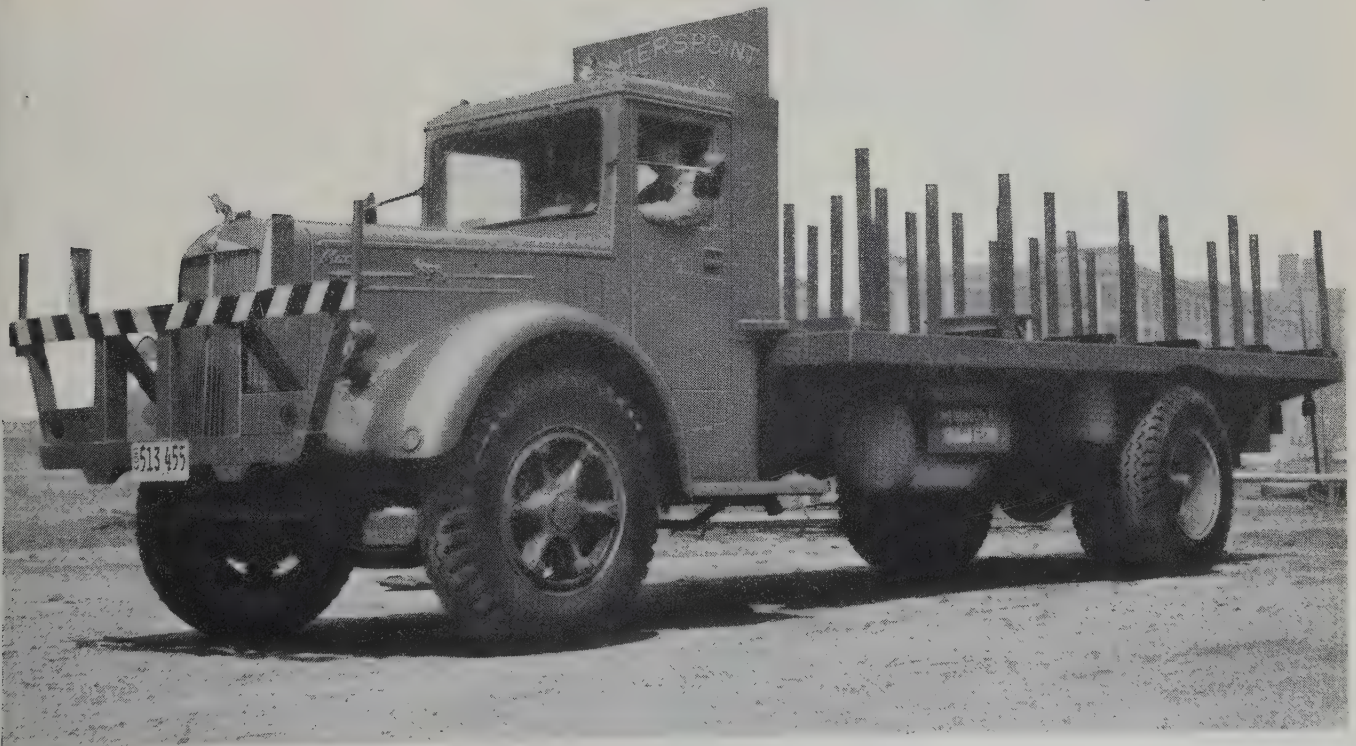
Your nearest Mack branch or distributor will give you the full story on what "Built Like A Mack" means in *extra* long life, *extra* strength and stamina, *extra* performance and *extra* dependability.



**...outlast them all**

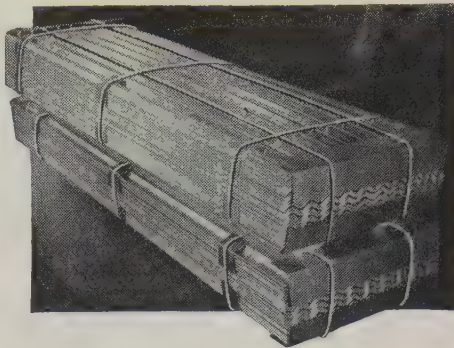
Mack Trucks, Empire State Building, New York 1, N.Y. Factories at Allentown, Pa.; Plainfield, N. J.; Long Island City, N. Y. Factory branches and distributors in all principal cities for service and parts. In Canada: Mack Trucks of Canada, Ltd.

Hauling heavy steel and iron products is one more job where Mack trucks "see you through" with long-lasting dependable operation. This Model LJ Mack serves Hunters Point Steel Co. of Long Island City, N. Y.





Galvanized Corrugated Roofing Sheets are firmly bound with Gerrard #8 ga. Round Steel Strapping. Bundles slide over each other without tearing round straps.



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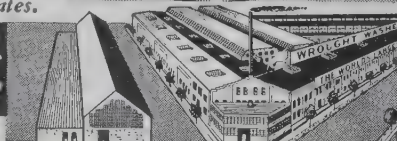
Large volume production, the most advanced methods and facilities, plus more than 60 years of continuous experience in the manufacture of Washers, are factors that enable us to offer you top quality washers and stampings at competitive costs. Over 22,000 sets of dies for making Washers of every type (Standard and Special), from every type of material, for every purpose, in any finish. STAMPINGS of all descriptions; Blanking, Forming, Drawing. *Submit your blueprints and quantity requirements for estimates.*



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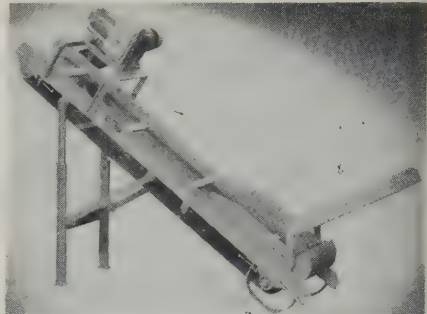


versa readily as both plain and geared mountings are identical. The geared trolley is constructed the same as the plain type except that wheels are furnished with gear rings having cut teeth, pinions with cut teeth, handwheel, hand chain and hand chain guide. Thrust rollers are mounted to insure proper alignment of the assembly whether on straight or curved track.

Check No. 8 on Reply Card for more Details

### Auxiliary Conveyor Unit

Series S conveyor designed for permanent or semipermanent installation is announced by May-Fran Engineering Inc., 1725 Clarkstone Rd., Cleveland 12, O. It can be moved when working areas or plant layouts change because it does not need to be bolted down. Developed for eco-



nomical handling of small metal parts such as stampings, castings, borings, turnings and chips, it is useful as an auxiliary unit with a permanent conveyor system to feed or discharge high production items.

Telescopic legs permit discharge end to be lowered or raised as required. In the 4-foot size, the discharge end can be raised from a minimum of 27½ inches to a maximum of 37 inches; in the 6-foot size, from 37 to 57 inches; in the 8-foot size from 40 to 70 inches; in the 10-foot size from 48 to 87 inches; and in the 12-foot size from 56 to 96 inches.

Check No. 9 on Reply Card for more Details

### Tractor Sweeper Attachment

A specially designed sweeper for the Ford tractor is being manufactured by Meili-Blumberg Corp., New Holstein, Wis. It is suitable for a variety of applications in industrial plants, warehouses, etc. Broom may be attached or removed within half an hour and may be raised 8 inches by finger tip power hydraulic control. It tilts to adjust the various surfaces and a full length dust hood protects the operator.

Rear power take-off at a fixed ratio to engine speed drives the broom



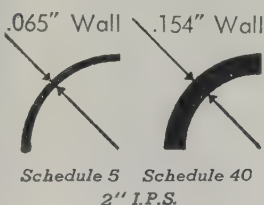
# is Tough to Get...

*but* using light weight **Schedule 5 Pipe** will almost double the supply

—and you pay less per foot!

## What Schedule 5 Pipe Is—

A light wall pipe, Carpenter *Schedule 5* gives you more feet of pipe for every pound of scarce stainless steel. So you can quickly see how *Schedule 5* increases the amount of pipe available and reduces your cost per foot. Plus the fact that the larger I.D. means increased flow area. These cut-away sections of pipe show the actual difference in wall thickness.



## How Schedule 5 Reduces Costs

First saving is 40% to 50% on the cost of your pipe. And, because *Schedule 5* lets you use the next smaller pipe size, you reduce by as much as 25% your costs of valves, fittings, etc. Carpenter *Schedule 5* Pipe often permits the use of the next smaller pipe size, because of its larger inside diameter.

## How It Hooks Up With Tube

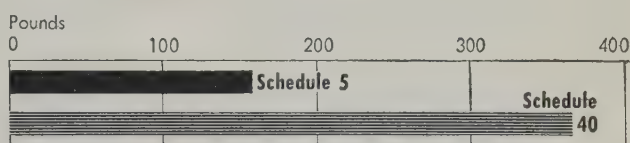
This pipe is easily adapted to use with existing lines of tubing or Schedule 40 and 10 pipe, using simple connectors available from several manufacturers.

## Why It Means More Pipe

You get *more feet of pipe* for every pound of material with Carpenter *Schedule 5* Stainless Pipe. And

we don't have to tell you how important it is to get *more steel* from every pound of nickel and chrome these days.

2" I.P.S. STAINLESS PIPE weight per 100 feet



## How It Resists Corrosion

You get the full corrosion resistance of the stainless analysis with Carpenter *Schedule 5* Pipe. It is made in standard A.I.S.I. analyses of stainless steel.

## What Pressures It Handles

All sizes of Carpenter *Schedule 5* Pipe will handle 150 psi working pressures with a good margin of safety. Sizes up to 1½" will safely handle considerably higher working pressures. Where high pressures are involved, however, Schedule 40 may be required.

**Data Sheets Give You More** information about this opportunity to get more stainless pipe for essential uses. Write for a copy now. Under today's conditions, Carpenter *Schedule 5* Stainless Pipe may help solve several big problems, including "When can I get the pipe I need?"



**THE CARPENTER STEEL COMPANY**  
Alloy Tube Division, Union, N. J.

Export Department: Carpenter Steel Co., Reading, Pa., "CARSTEELCO"

# Carpenter

## STAINLESS TUBING & PIPE

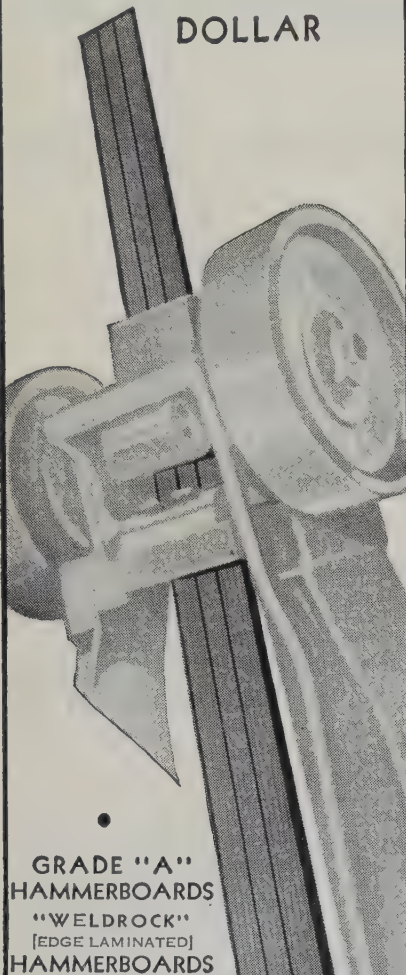


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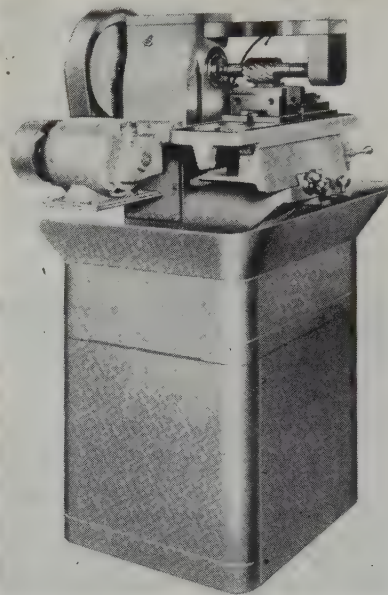
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Foleshill Works • Coventry, England

straight line pull and permit operation in either direction. Mounting is made at 90-degree corner of the conveyor line. Instant adjustment of conveyor speeds of from 3 to 9 feet per minute while unit is in operation is made possible by the varispeed drive which is on all standard power units. Check No. 12 on Reply Card for more Details

### Small Parts Milling

Light production machine for fast milling of small parts requiring close limits and fine finish is a development of Viking Industries, 220 Montague St., Rockford, Ill. No. 618 hydraulic Speed-Mill features an automatic milling cycle, hydraulic feeds, small amount of floor space and maxi-



mum rigidity for cuts using rotary cutters up to 6-inch diameter.

Machine cycles within a range of 10 seconds to 18 minutes. Hydraulic feed through valve selection is infinite  $\frac{3}{8}$  to 24 inches per minute over a 7-inch maximum length of cut. A separate  $\frac{3}{4}$ -inch motor assures positive steady power to the spindle. A standard  $\frac{1}{2}$ -hp motor drives the hydraulic motor and coolant pump off the same shaft. Coolant system is supplied from an 8 gallon coolant reservoir. Maximum travel for the 6 x 18-inch table under power is 8  $\frac{1}{2}$  inches.

Check No. 13 on Reply Card for more Details

### Oscillating Trough Conveyor

Link-Belt Co., 307 N. Michigan Ave., Chicago 1, Ill., is producing an oscillating trough type conveyor called the Flexmount for the handling of a variety of loose bulk materials at moderate capacities. Steel chips and turnings are handled with

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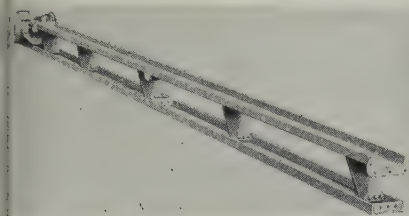
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AMERICAN CHAIN & CABLE



virtually no wear of metal troughing. Design features use of a one-piece metal trough with high sides, supported on one-piece flexible members which function as springs in absorbing the energy of the trough movement at each end of the stroke.

Conveyor trough is normally 4 inches deep and can be furnished in standard widths of 8 to 24 inches made of 10 or 12 gage steel, stain-



less or corrosion resisting steel or other material. Motion is imparted to trough by a roller-bearing, constant-stroke eccentric. Oscillation at the natural frequency of the mounts reduces the reaction forces on the drive to a minimum and requires only the horsepower necessary to convey the material. Lengths up to 100 feet can be furnished and dividers can be installed to convey several materials simultaneously. Discharge is possible at any desired point.

Check No. 14 on Reply Card for more Details

## Controls Air-Fuel Ratio

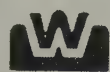
An air-fuel ratio controller announced by Leeds & Northrup Co., 4934 Stenton Ave., Philadelphia 44, Pa., is applicable to oil or gas firing, or to dual-fuel furnaces. It meters both fuel and air flow for maximum accuracy of control. Models are supplied to operate an electric or pneumatic control valve. Wide range of proportional band and reset control actions makes it easy to adjust the control to the needs of the furnace to which it is applied.

Major subassemblies are standardized and readily replaceable. Unit comes in a single instrument case which fits into standard panel cut-outs. Ratio extends from 50 per cent deficiency to 100 per cent excess air. Check No. 15 on Reply Card for more Details

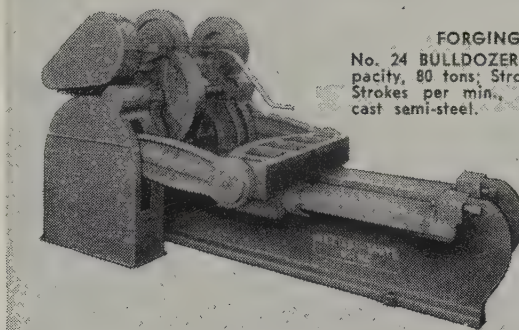
## Better Machinery Control

Improved starting and control of machine tools, presses and similar equipment is provided by the combination Life-Linestarter available from Westinghouse Electric Corp., Box 2099, Pittsburgh 30, Pa. Unit is available in NEMA sizes 1 through 5 with ratings up to 200 hp, 440 v polyphase.

Dirt, oil and splashing coolant are



# a full line . . . PRODUCTION MACHINERY

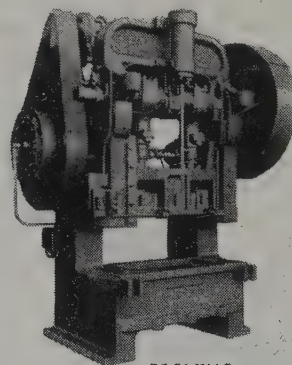


**FORGING**  
No. 24 BULLDOZER . . . Capacity, 80 tons; Stroke, 18 in.; Strokes per min., 10; Frame, cast semi-steel.

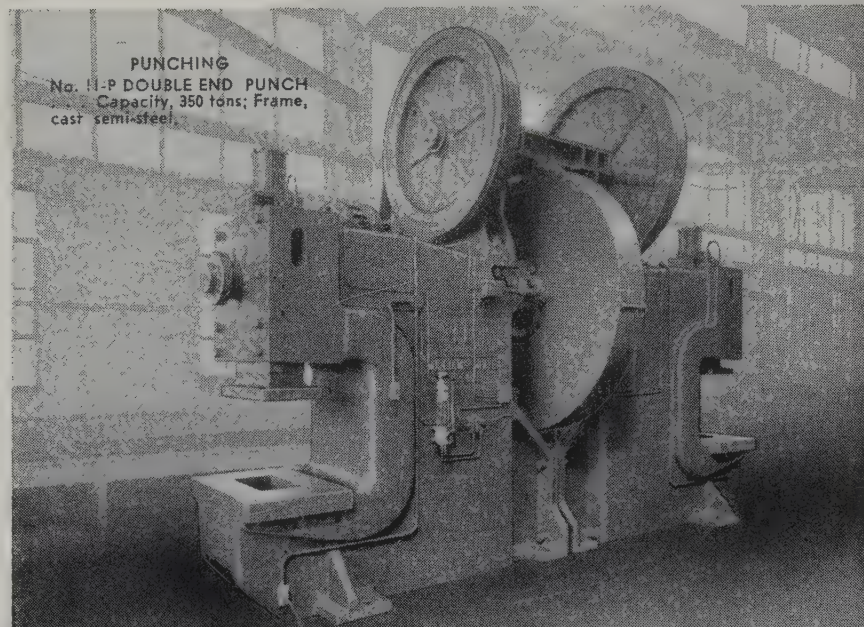


**BENDING**  
No. 22 EYEBENDER . . . Capacity 1 1/2" round bar hot on 2" mandrel; 3/4" round bar cold on 1 1/4" mandrel. 12 S.P.M.

The machines shown here are typical of the equipment built by WILLIAMS-WHITE to meet the particular needs of industry. If you are interested in machines similar to the ones illustrated, write us giving as much information as possible and we will send complete specifications.



**FORMING**  
No. 6 G-48 GAP FRAME PRESS . . . Capacity, 125 tons; Strokes per min., 35; Frame, semi-steel casting.



**PUNCHING**  
No. 11-P DOUBLE END PUNCH . . . Capacity, 350 tons; Frame, cast semi-steel.

MAKERS OF PRECISION PRODUCTION MACHINERY FOR NEARLY 100 YEARS

**WILLIAMS-WHITE & Co.**  
MOLINE, ILLINOIS



kept out of the type 12 enclosure by using a continuous neoprene gasket and external mounting brackets. Breaker is operated by a slam-proof, self-indicating external handle but enclosure must be opened to reset overload relays.

Check No. 16 on Reply Card for more Details

## Holds Sheet Metal Parts

To hold sheet metal parts preparatory to riveting, Aviation Development Inc., Burbank, Calif., offers Avdel sheet grippers. They operate without the use of springs or special tools and sheet metal parts are drawn closely together. Grippers are available in hole sizes of 3/32, 1/8, 5/32 and 3/16-inch.

Check No. 17 on Reply Card for more Details

## Manual Starter

Class 2510 type A fractional horsepower manual starter designed to control and protect single-phase alternating and direct current motors of 1 hp or less is announced by Square D Co., Milwaukee 12, Wis. Both single and double-pole devices are available. General purpose, water and dust-tight and explosion-resistant enclosures as well as open-type starter are available.

Check No. 18 on Reply Card for more Details

## Redesigned Respirator

Mine Safety Appliances Co., Pittsburgh 8, Pa., offers the Comfo respirator for protection of workers in industries where toxic or fibrosis-producing dusts are hazards. It features a new type mineral wool filter that requires less than half the filter area and offers only half the breathing resistance of previous models with same dust collecting efficiency.

Check No. 19 on Reply Card for more Details

## Primer Wets Rust

Rustbond primer, developed by Carboline Co., St. Louis 5, Mo., contains a vehicle that makes it capable of locking paint film to surfaces having adherent rust. Its wetting action is evident by its ability to reduce the splitting of top vinyl finishes to nearly zero. The coating also reduces portions of the rust particles from iron oxide to iron.

Check No. 20 on Reply Card for more Details

## Holder for Curved Marking

A holder for simplifying the stamping of curved line markings on the ends of small rounded parts is available from M. E. Cunningham Co., Pittsburgh, Pa. Model SH-15 curved line holder is made of Mecco safety

steel to prevent spalling or mushrooming. Type can be set in a partial or complete circle. Type is held in position by a plastic insert which expands when set screw in the center of the holder is tightened down against it.

Check No. 21 on Reply Card for more Details

## Low Carbon Steel Strip

To simplify the brazing of steel joints, American Silver Co. Inc., Flushing, N. Y., introduces Braze-Clad low carbon steel strip. It is clad with silver brazing alloy on one or both sides in any thickness ratio and melting range to suit particular requirements. Joint surfaces are pre-diffused with silver brazing alloy to eliminate need of such preplacements as wire rings, sheet washers and blanks.

Check No. 22 on Reply Card for more Details

## Electric Indicator, Printer

Gilmore Technical Associates, Cleveland 3, O., introduces a new electric indicator and printer for use with devices for measurement of displacement, force, weight and pressure. The printer can be controlled remotely or automatically. It gives either a continuous or individual record by tape or card.

Check No. 23 on Reply Card for more Details

## Heat Resistant Lacquer

United Lacquer Mfg. Corp., Everett, Mass., has developed C 5173, a one-coat, heat resistant lacquer for use where temperatures up to 300 degrees are encountered. It may be applied by spraying and air dries in 15 minutes.

Check No. 24 on Reply Card for more Details

## Stamps Soft Metals

For stamping soft metals and mild steel, Numberall Stamp & Tool Co., Staten Island 12, N. Y., offers a new numbering and lettering detail press. All spacing adjustments, including table release are located in front of the press. Model 141 is hand operated; model 142, air operated and model 143, motorized.

Check No. 25 on Reply Card for more Details

## Marks Convex Surfaces

Acromark Co., Elizabeth, N. J., announces a new numbering tool that uses ordinary straight line flat surface marking type with an insert segment and becomes a tool for marking convex surfaces such as rods, bars, tubes, shafts, etc. Each piece of type is of standard body width and is easily removed from the holder, but due

to the segment piece blank that is placed between each piece of type, a curvature is obtained conforming to surface being marked.

Check No. 26 on Reply Card for more Details

## Sine Fixture Key

Jergens Tool Specialty Co., Cleveland, O., announces a new sine fixture key that eliminates five operations that were necessary in milling fixture key slots. The stemmed construction of the S key requires a bored hole instead of the standard milled fixture key slot.

Check No. 27 on Reply Card for more Details

## Indexing Drill Selector

A new indexing drill selector for fractional size drills from 1/16 to 1/2-inch is announced by W. A. Horejsi Co., Minneapolis, Minn. It may be mounted on the drill press column or on the wall. Drill sizes are marked on the side of the case which revolves on the supporting bracket.

Check No. 28 on Reply Card for more Details

## Transparent Cutting Fluid

Tuff-Kut, a water soluble transparent cutting fluid is introduced by Lubricants Inc., Detroit 2, Mich. It is smokeless and odorless and contains no petroleum oil. The fluid also gives protection against rust on machined parts. It is diluted with ordinary tap water.

Check No. 29 on Reply Card for more Details

## Bronze Bearings, Bushings

Bronze Bearings Inc., Cranford, N. J., offers an improved line of bronze bearings and bushings. They may be plain, flanged, split or any combination of these types. Finishes range from an accurate machine finish to a semifinish.

Check No. 30 on Reply Card for more Details

## Grinding Wheel Bond

XL, a new grinding wheel bond, has been developed by Chicago Wheel & Mfg. Co., Chicago, Ill., for tungsten carbide tool sharpening. Wheels are recommended for offhand or precision grinding of carbide tools on milling cutters, broaches, reamers, counterbores and other similar applications.

Check No. 31 on Reply Card for more Details

## FOR MORE INFORMATION

on the new products and equipment in this section, fill in a card. It will receive prompt attention.



KOREAN peace negotiations are injecting a slight note of uncertainty in the steel and metalworking industries, now producing at a record pace. Metalworking executives agree with Washington that the armament program must be pushed ahead as projected—truce or no truce. The defense program combined with a heavy capital expenditures program will maintain an active economy. At the same time, industry men believe that a cease-fire agreement would result in a psychological letdown by the public and may take the pressure off demand for hard civilian goods. Some retailers report that demand for new autos and domestic appliances has slackened and ascribe the dip to the truce negotiations. Gray market steel prices have eased as result of the peace conversations.

**SHIFT TO CMP**—Few metalworking people expect the materials supply to become much freer should a cease-fire agreement be reached. Steel, copper and aluminum still are expected to be tight through the remainder of this year. Steel consumers have been converting their DO-rated orders to the Controlled Materials Plan and by weekend most of them were over the hump. With July 7 the official deadline, last week witnessed a deluge of tonnage placed for September, the last month of the quarter still open for scheduling of carbon grades. Most of this came from the larger consumers who did not receive their allotments as quickly as the smaller consumers, primarily because the larger users' applications are more difficult to process.

**DEMAND-SUPPLY**—Unrated consumers see a tighter squeeze in September after schedules are established by the mills later this week on products requiring a 45-day lead time. On products in tightest supply—plates, shapes, bars and hot-rolled sheets—substantial arrearages will be carried over at the end of August. This combined with a high percentage of set-asides will leave little free tonnage in September. Cold-rolled sheets are a little

easier and producers say some free tonnage will be available in September.

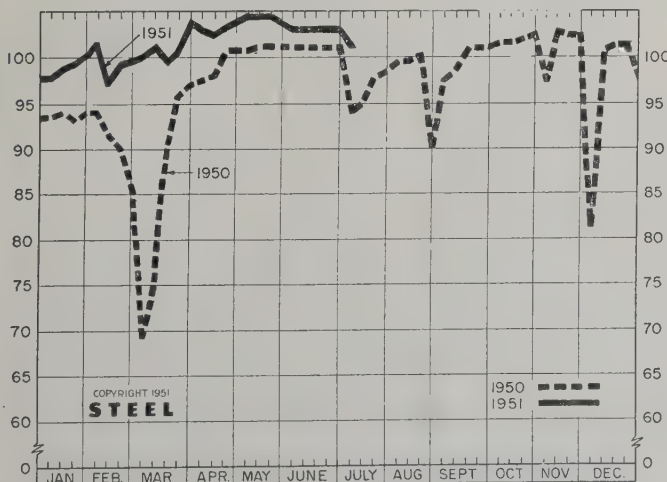
**SCRAP**—Basic open hearth scrap at dealers' yards is being allocated at some centers. This reflects the growing stringency at some mills and the desire by the government to keep scrap generated locally from being shipped outside the district.

**PRICES**—Price rollbacks on industrial products are out of the picture for July at least and possibly longer. Congressional action in extending the Defense Production Act for 31 days clipped plans of the Office of Price Stabilization to fix new price ceilings on many industrial products July 2. New ceilings on lead scrap and aluminum scrap and secondary ingot were set just before the extension and prices on these commodities were rolled back to a more normal relationship with primary prices.

Nickel bearing steel prices are advanced to reflect the 6-cent a pound increase in nickel, made effective June 1. Other ferrous metal prices are firm at established ceilings. STEEL's weighted index on finished steel holds at 171.92 and compares with 156.69 while the arithmetical price composite holds at \$106.32 and compares with \$94.36. Pig iron composites are unchanged from the preceding week and compare with those for the like week a year ago as follows: No. 2 foundry, \$52.54 and \$46.47; basic, \$52.16 and \$45.97; malleable pig iron, \$53.27 and \$47.27. Steelmaking scrap composite holds at \$44 and compares with \$36.83 a year ago.

**PRODUCTION**—Steel mill operators maintained continuous operations over the July 4 holiday to meet the urgent demands for coke, pig iron and steel. Ingot operations eased only 2 points to 101 per cent of capacity, equivalent to production of about 2,020,000 tons of ingots and steel for castings. Output during the holiday week last year was only 1,765,200 tons.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

Percentage of Capacity Engaged at Leading Production Points

	Week Ended July 7	Change	Same Week 1950	Same Week 1949
Pittsburgh .....	97.5	- 1.5*	94.5	53.5
Chicago .....	106.5	+ 0.5	98	68.5
Mid-Atlantic .....	99	- 3	96.5	68
Youngstown .....	105	0	105	50
Wheeling .....	93.5	- 5	93	68
Cleveland .....	98.5	- 2	52	64.5
Buffalo .....	104	0	104	85
Birmingham .....	100	0	100	100
New England .....	91	+ 4	60	38
Cincinnati .....	106	+ 9	90	72
St. Louis .....	84.5	-14.5	78	75.5
Detroit .....	101.5	+ 0.5*	104	91
Western .....	103.5	- 1.5	98	79.5
Estimated national rate .....	101	- 2	94	60

Based on weekly steelmaking capacity of 1,999,034 tons for 1951; 1,928,721 tons for second half, 1950; 1,906,268 tons for first half, 1950; 1,843,516 tons for 1949.

\* Change from revised rate for preceding week.



## Composite Market Averages

	July 5 1951	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
<b>FINISHED STEEL INDEX, Weighted:</b>					
Index (1935-39 av.—100)...	171.92	171.92	171.92	156.69	112.04
Index in cents per lb. ....	4.657	4.657	4.657	4.245	3.035

## ARITHMETICAL PRICE COMPOSITES:

Finished Steel, NT .....	\$106.32	\$106.32	\$106.32	\$94.36	\$64.45
No. 2 Fdry, Pig Iron, GT...	52.54	52.54	52.54	46.47	28.17
Basic Pig Iron, GT .....	52.16	52.16	52.16	45.97	27.50
Malleable Pig Iron, GT .....	53.27	53.27	53.27	47.27	28.79
Steelmaking Scrap, GT ...	44.00	44.00	44.00	36.83	19.17

Weighted finished steel index based on average shipments and Pittsburgh district prices of the following 14 representative products during 5-year base period 1935-39: Structural shapes, plates, rails, hot-rolled and cold-finished bars, pipe, wire, nails, tin plate, hot and cold-rolled sheets, galvanized sheets, hot and cold-rolled strip. For complete explanation see STEEL, Sept. 19, 1949, p. 54.

Arithmetical steel price composite based on same products as the weighted finished steel index with the exception of rails, cold-finished bars, galvanized sheets and hot-rolled strip.

Basic and No. 2 foundry pig iron composites are based on average prices at Pittsburgh, Bethlehem, Birmingham, Buffalo, Chicago, Cleveland, Granite City, Youngstown. Malleable composite based on same points, except Birmingham.

Steelmaking scrap composite based on average prices of No. 1 heavy melting steel at Pittsburgh, Chicago and Philadelphia.

## Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

## FINISHED MATERIALS

	July 5 1951	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pittsburgh ....	3.70	3.70	3.70	3.45	2.50
Bars, H.R., Chicago .....	3.70	3.70	3.70	3.45	2.50
Bars, H.R., del. Philadelphia	4.20	4.20	4.20	3.93	2.86
Bars, C.F., Pittsburgh ....	4.55	4.55	4.55	4.10-15	3.10
Shapes, Std., Pittsburgh ...	3.65	3.65	3.65	3.40	2.35
Shapes, Std., Chicago .....	3.65	3.65	3.65	3.40	2.35
Shapes, del. Philadelphia ...	3.91	3.91	3.91	3.46	2.48
Plates, Pittsburgh .....	3.70	3.70	3.70	3.50	2.50
Plates, Chicago .....	3.70	3.70	3.70	3.50	2.50
Plates, Coatesville, Pa. ...	4.15	4.15	4.15	3.60	2.50
Plates, Sparrows Point, Md.	3.70	3.70	3.70	3.50	2.50
Plates, Claymont, Del. ....	4.15	4.15	4.15	3.60	2.50
Sheets, H.R., Pittsburgh ...	3.60-75	3.60-75	3.60-75	3.35	2.425
Sheets, H.R., Chicago .....	3.60	3.60	3.60	3.35	2.425
Sheets, C.R., Pittsburgh ...	4.35	4.35	4.35	4.10	3.275
Sheets, C.R., Chicago .....	4.35	4.35	4.35	4.10	3.275
Sheets, C.R., Detroit .....	4.55	4.55	4.55	4.30	3.375
Sheets, Galv., Pittsburgh...	4.80	4.80	4.80	4.40	4.05
Strip, H.R., Pittsburgh ...	3.75-4.00	3.75-4.00	3.75-4.00	3.25-50	2.35
Strip, H.R., Chicago .....	3.50	3.50	3.50	3.25	2.35
Strip, C.R., Pittsburgh ...	4.65-5.35	4.65-5.35	4.65-5.35	4.15-50	3.05
Strip, C.R., Chicago .....	4.90	4.90	4.90	4.30	3.15
Strip, C.R., Detroit .....	4.35-5.60	4.35-5.60	4.35-5.60	4.35-95	3.15
Wire, Basic, Pittsburgh ...	4.85-5.10	4.85-5.10	4.85-5.10	4.50	3.05
Nails, Wire, Pittsburgh ...	5.90-6.20	5.90-6.20	5.90-6.20	5.30	3.75
Tin plate, box, Pittsburgh.	\$8.70	\$8.70	\$8.70	\$7.50	\$5.25

## SEMIFINISHED

Billets, forging, Pitts. (NT)	\$66.00	\$66.00	\$66.00	\$63.00	\$47.00
Wire rods, $\frac{3}{8}$ -" Pitts. ..	4.10-30	4.10-30	4.10-30	3.85	2.30

## PIG IRON, Gross Ton

Bessemer, Pitts. ....	\$53.00	\$53.00	\$53.00	\$47.00	\$29.00
Basic Valley .....	52.00	52.00	52.00	46.00	28.00
Basic, del. Phila. ....	56.49	56.49	56.49	49.44	29.93
No. 2 Fdry, Pitts. ....	52.50	52.50	52.50	46.50	28.50
No. 2 Fdry, Chicago .....	52.50	52.50	52.50	46.50	28.50
No. 2 Fdry, Valley .....	52.50	52.50	52.50	46.50	28.50
No. 2 Fdry, Del. Phila. ...	56.99	56.99	56.99	49.94	30.43
No. 2 Fdry, Birm. ....	48.88	48.88	48.88	42.38	24.88
No. 2 Fdry (Birm.) del. Cin.	55.33	55.33	55.33	49.08	28.84
Malleable Valley .....	52.50	52.50	52.50	46.50	28.50
Malleable, Chicago .....	52.50	52.50	52.50	46.50	28.50
Charcoal, Lyles, Tenn. ...	66.00	66.00	66.00	60.00	33.00
Ferromanganese, Etna, Pa.	188.00	188.00	188.00	175.00	140.00*

\* Delivered, Pittsburgh.

## SCRAP, Gross Ton (including broker's commission)

No. 1 Heavy Melt, Pitts. ..	\$45.00	\$45.00	\$45.00	\$40.00	\$20.00
No. 1 Heavy Melt, E. Pa. ...	43.50	43.50	43.50	33.00	18.75
No. 1 Heavy Melt, Chicago.	43.50	43.50	43.50	37.50	18.75
No. 1 Heavy Melt, Valley ...	45.00	45.00	45.00	41.50	20.00
No. 1 Heavy Melt, Cleve. ...	44.00	44.00	44.00	39.50	19.50
No. 1 Heavy Melt, Buffalo. ...	44.00	44.00	44.00	39.00	19.25
Rails, Re-rolling, Chicago ...	52.50	52.50	52.50	47.50	22.25
No. 1 Cast, Chicago .....	49.00*	49.00*	49.00*	44.50	20.00

\* F.o.b. shipping point.

## COKE, Net Ton

Beehive, Furn, Connisvl. ...	\$14.75	\$14.75	\$14.75	\$14.25	\$8.75
Beehive, Fdry., Connisvl. ...	17.50	17.50	17.50	15.50	9.50
Oven Fdry., Chicago .....	21.00	21.00	21.00	21.00	14.35

## NONFERROUS METALS

Copper, del. Conn. ....	24.50	24.50	24.50	22.50	14.375
Zinc, E. St. Louis .....	17.50	17.50	17.50	15.00	8.25-9.50
Lead, St. Louis .....	16.80	16.80	16.80	10.80	9.35
Tin, New York .....	106.00	106.00	106.00	80.125	52.00
Aluminum, del. ....	19.00	19.00	19.00	17.50	15.00
Antimony, Laredo, Tex. ...	42.00	42.00	42.00	24.50	14.50
Nickel, refinery, duty paid.	56.50	56.50	56.50	48.00	35.00

## PIG IRON

F.o.b. furnace prices quoted under GCFR as reported to STEEL. Minimum delivered prices do not include 3% federal tax. Key to producing companies published on second following page.

## PIG IRON, Gross Ton

	Basic	No. 2 Foundry	Malle- able	Besse- mer
Bethlehem, Pa. B2 .....	\$54.00	\$54.50	\$55.00	\$55.50
Brooklyn, N.Y., del. ....	58.69	58.69	59.46	59.46
Newark, del. ....	56.74	57.24	57.74	58.24
Philadelphia, del. ....	56.49	56.99	57.49	57.99
<b>Birmingham District</b>				
Alabama City, Ala. R2 .....	48.38	48.88	48.88	48.88
Birmingham R2 .....	48.38	48.88	48.88	48.88
Birmingham S9 .....	48.38	48.88	48.88	48.88
Woodward, Ala. W15 .....	48.38	48.88	48.88	48.88
Cincinnati, del. ....	55.33	55.33	55.33	55.33
<b>Buffalo District</b>				
Buffalo R2 .....	52.00	52.50	53.00	53.00
Buffalo H1 .....	52.00	52.50	53.00	53.00
Tonawanda, N.Y. W12 .....	52.00	52.50	53.00	53.00
No. Tonawanda, N.Y. T9 .....	52.00	52.50	53.00	53.00
Boston, del. ....	61.63	62.13	62.63	62.63
Rochester, N.Y., del. ....	54.74	55.24	55.74	55.74
Syracuse, N.Y., del. ....	55.72	56.22	56.72	56.72

<b>Chicago District</b>				
Chicago I-3 .....	52.00	52.50	52.50	53.00
Gary, Ind. U5 .....	52.00	52.00	52.50	52.50
Indiana Harbor, Ind. I-2 .....	52.00	52.00	52.50	52.50
So. Chicago, Ill. W14 .....	52.00	52.50	52.50	52.50
So. Chicago, Ill. Y1 .....	52.00	52.50	52.50	52.50
So. Chicago, Ill. U5 .....	52.00	52.00	52.50	53.00
Milwaukee, del. ....	53.97	54.47	54.47	54.97
Muskegon, Mich., del. ....	58.20	58.20	58.20	58.20

<b>Cleveland District</b>				
Cleveland A7 .....	52.00	52.50	52.50	53.00
Cleveland R2 .....	52.00	52.50	52.50	52.50
Akron, del. from Cleve. ....	54.49	54.99	54.99	55.49
Lorain, O. N3 .....	52.00	52.00	52.50	53.00
Duluth I-3 .....	52.00	52.50	53.00	53.00
Erie, Pa. I-3 .....	52.00	52.50	52.50	53.00
Everett, Mass. E1 .....	51.75	51.75	52.25	52.25
Fontana, Calif. K1 .....	58.00	58.50	58.50	58.50
Geneva, Utah G1 .....	52.00	52.50	52.50	52.50
Seattle, Tacoma, Wash., del.	60.35	60.35	60.35	60.35
Portland, Oreg., del. ....	60.35	60.35	60.35	60.35
Los Angeles, San Francisco, del.	59.85	60.35	60.35	60.35
Granite City, Ill. G4 .....	53.90	54.40	54.90	54.90
St. Louis, del. (inc. tax) .....	54.66	55.16	55.66	55.66
Ironport, Utah C11 .....	52.00	52.50	52.50	52.50
Lone Star, Tex. L6 .....	48.00	*48.50	48.50	48.50
Minnequa, Colo. C10 .....	54.00	55.00	55.00	55.00

<b>Pittsburgh District</b>				
Nevels Island, Pa. P6 .....	52.50	52.50	52.50	53.00
Pitts., N.&S. sides, Ambridge,	53.74	53.74	53.74	54.24
Aliquippa, del. ....	53.49	53.49	53.49	53.99
McKees Rocks, del. ....	53.49	53.49	53.49	53.99
Lawrenceville, Homestead,	54.00	54.00	54.00	54.50
McKeesport, Monaca, del. ....	54.48	54.48	54.48	54.98
Verona, del. ....	54.72	54.72	54.72	55.22
Brackenridge, del. ....	52.00	52.50	52.50	53.00
Bessemer, Pa. U5 .....	52.00	52.00	52.00	52.00
Clairton, Rankin, So. Duquesne, Pa. U5	52.00	52.00	52.00	52.00
McKeesport, Pa. N3 .....	52.00	52.00	52.00	53.00
Monessen, Pa. P7 .....	54.00	54.00	54.00	54.00
Sharpsville, Pa. S6 .....	52.00	52.50	52.50	53.00
Steelton, Pa. B2 .....	54.00	54.50	55.00	55.50
Swedeland, Pa. A3 .....	56.00	56.50	57.00	57.50
Toledo, O. I-3 .....	52.00	52.50	52.50	53.00
Cincinnati, del. ....	57.21	57.71	57.71	57.71
Troy, N.Y. R2 .....	54.00	54.50	55.00	55.50
<b>Youngstown District</b>				
Hubbard, O. Y1 .....	52.00	52.50	52.50	53.00
Youngstown Y1 .....	52.00	52.50	52.50	53.00
Youngstown U5 .....	52.00	52.00	52.00	53.00
Mansfield, O., del. ....	56.43	56.93	56.93	57.43

\* Low phos, southern grade.

## PIG IRON DIFFERENTIALS

**Silicon:** Add 50 cents per ton for each 0.25% Si over base grade, 1.75-2.25%, except on low phos iron on which base is 1.75-2.00%.

**Phosphorus:** Deduct 38 cents per ton for P content of 0.70% and over. **Manganese:** Add 50 cents per ton for each 0.50% manganese over 1%, or portion thereof.

**Nickel:** Under 0.50% no extra; 0.50-0.74%, incl., add \$2 per ton and each additional 0.25%, add \$1 per ton.

## BLAST FURNACE SILVERLY IRON, Gross Ton

(Base 6.00-6.50% silicon; add \$1.50 for each 0.5% Si)

Jackson, O. G2, J1 .....	\$62.50
Buffalo H1 .....	63.75

## ELECTRIC FURNACE SILVERLY PIG IRON, Gross Ton

(Base 14.01-14.50% silicon; add \$1 for each 0.5% Si to 18%; \$1 for each 0.5% Mn over 1%; \$1 for each 0.045% max. P)

Niagara Falls, N.Y. P15 .....	\$88.00
Keokuk, Iowa, Openhearth & Fdry, frt. allowed K2 .....	92.50
Keokuk, OH & Fdry., 12 1/2 lb piglets, 16% Si, frt. allowed K2 .....	95.50
Wenatchee, Wash., O.H. & Fdry., frt. allowed K2 .....	92.50

## CHARCOAL PIG IRON, Gross Ton

(Low phos, semi-cold blast; differential charged for silicon over base grade; also for hard chilling iron Nos. 5 x 6)

Lyles, Tenn. T3 .....	\$66.00
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## LOW PHOSPHORUS PIG IRON, Gross Ton

Cleveland, intermediate, A7 .....	\$57.00
Steelton, Pa. B2 .....	60.00
Philadelphia delivered .....	63.12
Troy, N.Y. R2 .....	60.00



**Price tone of nonferrous metal markets remains firm despite uncertainty expressed in financial quarters due to peace negotiations. Copper shortage to continue through year**

OREAN peace negotiations are causing nervousness among traders in these metal issues on the country's leading stock exchanges since they are uncertain about the trend of metal prices should the peace efforts prove successful. This tension did not spread, however, to the actual metal markets.

While cessation of fighting undoubtedly would necessitate readjustments in the national economy, brakes would not be applied promptly on the defense efforts and a large portion of war material contracts would be carried through to completion. Consumption of metals will remain heavy through 1951. In addition, potential demand to replenish working stocks of metals at smelteries, refineries, fabricating plants will remain substantial regardless of the outcome of the peace talks.

Eric Johnston, economic stabilizer, told the Senate Finance Committee last week that despite attempts to boost copper production the country still will be short some 100,000 to 250,000 tons of its needs this year. The present situation in which Chilean producers get 27.50c a pound for copper and United States producers get only 24.50c is unsatisfactory.

"We are going to have to do one or the other soon," Mr. Johnston said, indicating the alternatives are either a boost in the United States price to 27.50c or a 3-cent subsidy to users of the imported metal. For the time being, he defended the higher price for Chilean copper on grounds that some buyers in the world market are paying 45.00c to 50.00c a pound for the metal.

## Tin Controls Tightened

Reconstruction Finance Corp. maintained its selling price for Grade A tin at \$1.06 through July 5. The government is expected to re-enter the world market for supplies soon, since the price has declined close to the level which is required for such action.

NPA has revised regulations governing the use of pig tin for the third quarter in order to make additional savings in the use of the metal and to give added incentives for more efficient utilization of tin scrap.

Conservation order M-8 now limits all users of pig tin to a rate of 90 per cent of the amount used during the first six months of 1950 and eliminates the "ex-quota" required by them to produce implements of war. The amount of tin any person can use without an allocation has been reduced to 6000 pounds from five long tons. The amount of inventory of lead base alloys that may be kept on hand has been reduced from 60 to 45 days.

Manufacturers of milk cans and tin plate are now programmed and may consume only that pig tin specifically

\*authorized by NPA, so they have been removed from the 90 per cent quota limitation.

For the first time, specifications have been established for wrought bronze alloys. This was done to reduce the amount of tin used in these alloys.

Solder used on electrical precision instruments, recording and indicating meters, dairy equipment, food processing equipment and hospital and sterilizing equipment has been reduced to 50 per cent tin content. Previously, an unlimited tin content was permitted in solder for these uses.

## OPS Pegs Aluminum Prices

OPS set new dollars-and-cents ceiling prices on secondary aluminum ingot at primary ingot levels and on aluminum scrap at relative levels, effective as of June 29. The new ceilings are 30 to 50 per cent below the previous prevailing market figures.

Prices of secondary aluminum ingot and aluminum scrap rose more sharply than primary aluminum prices following outbreak of the Korean War. Consequently, the general price freeze fixed primary ingot prices at about 20.00c a pound while secondary ingot was selling between 30.00c and 35.00c and scrap at 25.00c a pound.

New ceilings represent a rollback to levels reflecting the value of metallic content in terms of current prices for primary aluminum. Ceilings for various grades of aluminum scrap are set sufficiently below secondary ingot prices to provide an adequate margin for smelters and to encourage collection and segregation. CPR 54 also provides quantity premiums to encourage accumulation and distribution by sellers of relatively large lots.

A typical ceiling for secondary aluminum ingot is 20.50c a pound for 10,000 pounds or more for the alloy AXS679. In the scrap category, segregated S type copper-free solids, as an example, are priced at 13.00c a pound for quantities of 40,000 lb or more.

## Export Licensing Extended

Certain types of nonferrous metals, alloys and products have been added to the list of commodities subject to licensing against export quotas under CMP. Effective Aug. 1, Office of International Trade will revoke all licenses covering controlled commodities issued prior to June 1, 1951, unless revalidation of the licenses has been requested by the licensees and granted by OIT.

The commodities affected by this action include: Nickel silver, containing 40 per cent or more copper, in the form of bars, rods and sheets; beryllium copper rods, strips and wire and beryllium powder containing copper;

copper alloys, if copper content is 40 per cent or over, except brass, bronze, nickel or gold, in the form of bars, rods, bare wire, shapes, sheet, strip, plate, rolls, pipe, tubing, castings, and powder; beryllium metal tubes, phosphor-copper powder, cupro-nickel strips, cupro-nickel wire, copper-nickel wire, nickel-silver wire; building wire and cable, weatherproof and slow-burning wire, and insulated copper wire.

To facilitate the changeover to CMP, exporters who hold validated licenses issued before June 1 are permitted to continue to export controlled materials under those licenses, provided the materials are produced prior to July 1 and are loaded aboard an exporting carrier by midnight on July 31.

## STEEL'S Metal Price Averages for June, 1951

(Cents per pound)

Electrolytic Copper, del. Conn.	24.500
Lead, St. Louis	16.800
Prime, Western Zinc, E. St. Louis	17.500
Straits Tin, New York	117.962
Primary Aluminum ingots, del.	19.000
Antimony, f.o.b. Laredo, Tex.	42.000
Nickel, f.o.b. refinery	56.500
Silver, New York	88.492

## Harvey Places Plant Orders

Harvey Machine Co., of Torrance, Calif., is proceeding with its project to build an aluminum plant near Kalispell, Mont. The company has placed orders for around \$30 million worth of construction and electrical equipment. The firm's request for an RFC loan of \$70 million has not yet been approved, an official says.

## Canada Allocates Lead

Effective July 1, primary lead, refined secondary lead, slab zinc and cadmium were placed under direct allocation in Canada by the Non-Ferrous Metals Division of which F. V. C. Hewett is director.

These metals have been under informal rationing by producers for months, but this procedure is now replaced by an order approval system. Approval will not ordinarily be given where inventories are deemed to be excessive. It is not expected, however, that initially the supply of these metals to Canadian industry will be materially changed.

The new order is similar to those issued a short time ago for nickel, copper and aluminum. In addition to regulating the rate of metal consumption for commercial purposes, the orders prevent surplus buying. Purchase of lead and zinc in quantities of 2000 pounds or less in any one month and the sale of cadmium by the electroplating supply houses to electroplaters, will not require approval.



## NONFERROUS METALS

(Cents per pound, carlots, except as otherwise noted)

## Primary Metals

**Copper:** Electrolytic 24.50c, Conn. Valley; Lake 24.62½c, delivered.**Brass Ingots:** 85-5-5-5 (No. 115) 29.00c; 88-10-2 (No. 215) 44.50c; 80-10-10 (No. 305) 35.00c; No. 1 yellow (No. 405) 25.50c.**Zinc:** Prime western 17.50c; brass special 17.75c; intermediate 18.00c, East St. Louis; high grade 18.85c, delivered.**Lead:** Common 16.80c; chemical 16.90c; cor-rod- ing 16.90c, St. Louis.**Primary Aluminum:** 99% plus, ingots 19.00c, pigs 18.00c. Base prices for 10,000 lb and over. Freight allowed on 500 lb or more but not in excess of rate applicable on 30,000 lb. c.l. orders.**Secondary Aluminum:** Piston alloys 20.50c; No. 12 foundry alloy (No. 2 grade) 19.50c; steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 18.00c; grade 2, 17.75c; grade 3, 17.25c; grade 4, 16.50c. Prices include freight at c.l. rate up to 75 cents per 100 lb.**Magnesium:** Commercially pure (99.8%) stand-ard ingots, 10,000 lb and over 24.50c, f.o.b. Freeport, Tex.**Tin:** Grade A, prompt 106.00.**Antimony:** American 99-99.8% and over but not meeting specifications below 42.00c; 99.8% and over (arsenic 0.05% max.; other impuri- ties 0.1% max.) 42.50c; f.o.b. Laredo, Tex., for bulk shipments.**Nickel:** Electrolytic cathodes, 99.9%, base sizes at refinery, unpacked, 56.50c; 25-lb pigs, 59.15c; "XX" nickel shot, 60.15c; "E" nickel shot or ingots, for addition to cast iron, 56.50c. Prices include import duty.**Mercury:** Open market, spot, large lots, New York, \$210-213 per 76-lb flask.**Beryllium-Copper:** 3.75-4.25% Be, \$1.56 per lb of alloy, f.o.b., Reading, Pa.**Cadmium:** "Regular" straight or flat forms, \$2.55 del.; special or patented shapes \$2.80.**Cobalt:** 97.99%, \$2.10 per lb for 500 lb (kegs); \$2.12 per lb for 100 lb (case); \$2.17 per lb under 100 lb.**Gold:** U. S. Treasury, \$35 per ounce.**Silver:** Open market, New York 87.75c per oz.**Platinum:** \$90-93 per ounce from refineries.**Palladium:** \$24 per troy ounce.**Iridium:** \$200 per troy ounce.**Titanium (sponge form):** \$5 per pound.

## Rolled, Drawn, Extruded Products

## COPPER AND BRASS

(Base prices, cents per pound, f.o.b. mill; effective May 23, 1951)

**Sheet:** Copper 40.18; yellow brass 37.28; commercial bronze 95% 40.18; 90% 39.78; red brass, 85% 38.86; 80% 38.47; best quality, 38.07; nickel silver, 18%, 50.99; phosphor-bronze grade A, 5%, 59.42.**Rod:** Copper, hot-rolled 36.03; cold-drawn 37.28; yellow brass free cutting, 31.70; commercial bronze, 95%, 39.87; 90%, 39.47; red brass 85%, 38.55; 80%, 38.16.**Seamless Tubing:** Copper 40.22; yellow brass 40.29; commercial bronze, 90%, 42.44; red brass, 85% 41.77.**Wire:** Yellow brass 37.57; commercial bronze, 95%, 40.47; 90%, 40.07; red brass, 85%, 39.15; 80%, 38.76; best quality brass, 38.36.**Copper Wire:** Bare, soft, f.o.b. eastern mills, c.l. 28.67-30.285; l.c.l. 29.17-30.92; 100,000 lb lots 28.545-30.295; weatherproof, f.o.b. eastern mills, c.l. 30.10, l.c.l. 30.18, 100,000 lb lots 29.35; magnet, del., 15,000 lb or more 34.50, l.c.l. 35.25.

## DAILY PRICE RECORD

	Copper	Lead	Zinc	Tin	Aluminum	Antimony	Nickel	Silver
1951								
July 2-5	24.50	16.80	17.50	106.00	19.00	42.00	56.50	90.16
June 28-30	24.50	16.80	17.50	106.00	19.00	42.00	56.50	90.16
June 18-27	24.50	16.80	17.50	106.00	19.00	42.00	56.50	87.75
June 15-16	24.50	16.80	17.50	111.00	19.00	42.00	56.50	87.75
June 14	24.50	16.80	17.50	118.00	19.00	42.00	56.50	87.75
June 13	24.50	16.80	17.50	123.00	19.00	42.00	56.50	87.75
June 8-12	24.50	16.80	17.50	129.00	19.00	42.00	56.50	87.75
June 7	24.50	16.80	17.50	136.00	19.00	42.00	56.50	87.75
June 1-6	24.50	16.80	17.50	136.00	19.00	42.00	56.50	87.75
June Avg.	24.50	16.80	17.50	117.962	19.00	42.00	56.50	88.492
May Avg.	24.50	16.80	17.50	139.923	19.00	42.00	50.50	90.16
Apr. Avg.	24.50	16.80	17.50	145.735	19.00	42.00	50.50	90.16

NOTE: Copper; Electrolytic, del. Conn. Valley; Lead, common grade, del. St. Louis; Zinc, prime west, E. St. Louis; Tin, Straits, del. New York; Aluminum primary ingots, 99%, del.; Antimony, bulk, f.o.b. Laredo, Tex.; Nickel, electrolytic cathodes, 99.9%, base sizes at refinery unpacked. Silver, open market, New York. Prices, cents per pound; except silver, cents per ounce.

## ALUMINUM

(30,000 lb base; freight allowed on 500 lb or more, but not in excess of rate applicable on 30,000 lb c.l. orders)

Sheets and Circles: 2S and 3S mill finish c.l.

Thickness Range Inches	Widths or Diameters, In., Inc.	Flat Sheet Base*	Coiled Sheet Base	Coiled Sheet Circle†
0.249-0.136	12-48	30.1	...	...
0.135-0.096	12-48	30.6	...	...
0.095-0.077	12-48	31.2	29.1	33.2
0.076-0.061	12-48	31.8	29.3	33.4
0.060-0.048	12-48	32.1	29.5	33.7
0.047-0.038	12-48	32.5	29.8	34.0
0.037-0.030	12-48	32.9	30.2	34.6
0.029-0.024	12-48	33.4	30.6	35.0
0.023-0.019	12-36	34.0	31.1	35.7
0.018-0.017	12-36	34.7	31.7	36.6
0.016-0.015	12-36	35.5	32.4	37.6
0.014	12-24	36.5	33.3	38.9
0.013-0.012	12-24	37.4	34.0	39.7
0.011	12-24	38.4	35.0	41.2
0.010-0.0095	12-24	39.4	36.1	42.7
0.009-0.0085	12-24	40.6	37.2	44.4
0.008-0.0075	12-24	41.9	38.4	46.1
0.007	12-18	43.3	39.7	48.2
0.006	12-18	44.8	41.0	52.8

\* Lengths 72 to 180 inches. † Maximum di- ameter, 26 inches.

Screw Machine Stock: 5000 lb and over.

Diam. (in.) or distance across flats	Round R317-T4, 17S-T4	Hexagonal R317-T4 17S-T4
0.125	52.0	...
0.156-0.188	44.0	...
0.219-0.313	41.5	...
0.375	40.0	46.0
0.406	40.0	...
0.438	40.0	46.0
0.469	40.0	...
0.500	40.0	46.0
0.531	40.0	...
0.563	40.0	45.0
0.594	40.0	...
0.625	40.0	43.5
0.688	40.0	45.0
0.750-1.000	39.0	41.0
1.063	39.0	41.0
1.125-1.500	37.5	39.5
1.563	37.0	...
1.625	36.5	39.5
1.688-2.000	36.5	...

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh) Sheets: Full rolls, 140 sq ft or more \$22.00 per cwt; add 50c cwt 10 sq ft to 140 sq ft. Pipe: Full coils \$22.00 per cwt. Traps and bends: List prices plus 60%.

## ZINC

Sheets, 24.50c, f.o.b. mill 36,000 lb and over. Ribbon zinc in coils, 23.00c, f.o.b. mill, 36,000 lb and over. Plates, not over 12-in., 23.50-24.50c; over 12-in., 23.50-24.50c.

## "A" NICKEL

(Base prices f.o.b. mill)  
Sheets, cold-rolled 77.00c. Strip, cold-rolled, 83.00c.  
Rods and shapes, 73.00c. Plates, 75.00c.  
Seamless tubes, 106.00c.

## MONEL

(Base prices, f.o.b. mill)  
Sheets, cold-rolled 60.50c. Strip, cold-rolled 63.50c.  
Rods and shapes, 58.50c. Plates, 59.50c. Seamless tubes, 93.50c. Shot and blocks, 53.50c.

## MAGNESIUM

Extruded Rounds, 12 in. long, 1.31 in. in diameter, less than 25 lb, 55.00-62.00c; 25 to 99 lb, 45.00-52.00c; 100 lb to 5000 lb, 41.00c.

## TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill)  
Sheets, \$15; sheared mill plate, \$12; strip, \$15; wire, \$10; forgings, \$6; hot-rolled and forged bars, \$6.

## Plating Materials

**Chromic Acid:** 99.9% flake, f.o.b. Philadelphia, carloads, 27.00c; 5 tons and over 27.50c; 1 to 5 tons, 28.00c; less than 1 ton 28.50c.

**Copper Anodes:** Base 2000 to 5000 lb; f.o.b. shipping point, freight allowed: Flat un- trimmed 37.69c; oval 37.19c. Cast 37.375c, delivered in eastern territory.

**Copper Cyanide:** 70-71% Cu, 100-lb drums, 1000 lb 60.8c, under 1000 lb 62.8c, f.o.b. Niagara Falls, N. Y.

**Sodium Cyanide:** 96-98% ½-oz ball, in 200 lb drums, 1 to 900 lb, 19.00c; 1000 to 19,900 lb, 18.00c, f.o.b. Niagara Falls, N. Y. Packages in 100 lb drums add ½-cent.

**Copper Carbonate:** 54-56% metallic Cu; 50 lb bags, up to 200 lb, 29.25c; over 200 lb 28.25c, f.o.b. Cleveland.

**Nickel Anodes:** Rolled oval, carbonized, car- loads, 63.50c; 10,000 to 30,000 lb, 69.50c; 30,000 to 10,000 lb, 70.50c, 500 to 3000 lb 71.50c; 100 to 500 lb, 73.50c; under 100 lb, 76.50c, f.o.b. Cleveland.

**Nickel Chloride:** 100-lb kegs, 35.00c; 400-lb bbl, 33.00c; up 10,000 lb, 32.50c; over 10,000 lb, f.o.b. Cleveland, freight allowed on barrels, 4 or 4 more kegs.

**Sodium Stannate:** 25 lb cans only, less than 100 lb, to consumers 79.20c; 100 or 350 lb drums only, 100 to 600 lb, 64.50c; 700 to 1900 lb, 62.00c; 2000 to 9900 lb, 60.20c. Freight allowed east of Mississippi and north of Ohio and Potomac rivers.

## Scrap Metals

## Brass Mill Allowances

Ceiling prices in cents per pound for less than 20,000 lb, f.o.b. shipping point, effective June 26, 1951.

	Clean Heavy	Rod Ends	Clean Turnings
Copper	21.50	21.50	20.75
Yellow Brass	19.125	18.875	17.875
Commercial Bronze			
95%	20.50	20.25	19.75
90%	20.50	20.25	19.75
Red Brass			
85%	20.25	20.00	19.375
80%	20.125	19.875	19.375
Muntz metal	18.125	17.875	17.375
Nickel, silver, 10%	21.50	21.25	10.75
Phos. bronze, A	27.00	26.75	25.75

## Copper Scrap Ceiling Prices

(Base prices, cents per pound, less than 40,000 lb f.o.b. point of shipment)

Group I: No. 1 copper 19.25; No. 2 copper wire and mixed heavy 17.75; light copper 16.50; No. 1 borings 19.25; No. 2 borings 17.75; refinery brass, 17.00 per lb of dry Cu content for 50 to 60 per cent material and 17.25 per lb for over 60 per cent material.

Group II: No. 1 soft red brass solids 19.50; No. 1 composition borings 19.25 per lb of Cu content plus 83 cents per lb of tin content; mixed brass borings 19.25 per pound of Cu content plus 78 cents per lb of tin content; unlined red car boxes 19.25; lined red car boxes 18.25; cocks and faucets 16.75; mixed brass screens 16.00; zincy bronze solids and borings 16.25.

## Zinc Scrap Ceiling Prices

(Cents per pound, f.o.b. point of shipment)

Unswaged zinc dross, 12.25c; new clippings and trimmings, 14.50; engravers' and litho- graphers' plates, 14.50; die cast slabs, min. 90% zinc, 12.25; old zinc scrap, 11.25c; form- ing and stamping dies, 11.25; new die cast scrap, 10.75; old zinc die cast radiator grills, 10.50; old die cast scrap, 9.50c.

## Lead Scrap Ceiling Prices

(F.o.b. point of shipment)

Battery lead plates, 17.00c per lb of lead and antimony content, less smelting charge of 2 cents per lb of material in lots 15,000 lb or more; less 2.25c, in lots less than 15,000 lb. Used storage batteries (in boxes) drained of liquid, 6.60c for 15,000 lb or more; 6.40c for less than 15,000 lb. Soft lead scrap, hard lead scrap, battery slugs, cable lead scrap or lead content of lead-covered cable scrap, 15.25c per lb. In addition, brokerage commissions are permitted.

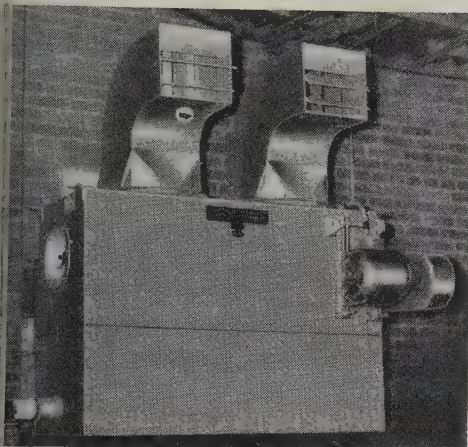
## Aluminum Scrap Ceiling Prices

(Cents per pound, f.o.b. point of shipment, less than 5000 lb)

Segregated plant scrap: 2s solids, copper free, 10.50; high grade borings and turnings, 8.50; No. 12 piston borings and turnings, 7.50; Mixed plant scrap: Copper-free solids, 10.00; dural type, 9.00; Obsolete scrap: Pure old cable, 10.00; sheet and sheet utensils, 7.25; old castings and forgings, 7.75; clean pistons, free of struts, 7.75; pistons with struts, 5.75.



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## Sheets, Strip . . .

Sheet and Strip Prices, Page 129 & 130

**Pittsburgh**—One-week grace period starting July 1 to allow carryovers to be reduced before initiation of CMP will help many unfortunate non-rated customers who have waited many months for sheets. When mill delays occurred in the past, the rated orders received preference at the expense of nonrated. Grace period will allow producers to work on their backlogs; carryovers will be reduced, but not eliminated. There are no other signs of relief on hot and cold-rolled sheets. Defense and directives will take greater tonnage in July than heretofore.

**New York**—Some free tonnage in cold-rolled sheets may be available in September, although on a more restricted scale than in August. Actually there have been some cancellations of cold sheets for August by stove and cabinet makers and by some other manufacturers of durable goods. Sellers will have until the middle of this month to set up schedules for September on major grades and, as they are in the middle of appraising extent of their CMP allocations, they will soon know approximately where they stand with respect to unrated work. All seem confident they will have some such tonnage to spare.

**Cincinnati**—Bookings by mills indicate progressive tightening in the sheet supply for nonrated users. Transition to CMP is attended by some confusion and by further realization that directed programs and defense needs are absorbing a steadily increasing tonnage.

## Steel Bars . . .

Bar Prices, Page 129

**New York**—Hot carbon bar sellers report a flurry of orders for September as consumers last week certified DO ratings under CMP. Many small consumers got in certifications early as Washington was able to process their applications rapidly. However, most of the larger consumers were not able to get their allotments before last week, so that tonnage-wise the great bulk of conversion from DO's to CMP's fell within the past few days. A further heavy influx of these orders is expected July 9 inasmuch as the official deadline fell on July 7, at the end of the week. Most mills plan to take a liberal view of July 9 receipts. They will then have until the end of the second week in July to schedule these and other orders before the deadline for September rollings. In the case of alloy bars, which require a longer lead time, September is already out of the question and such conversions to CMP as are now being made won't become effective on mill books before fourth quarter.

**Boston**—Supply rather than prices occupies most consumers, but an increase in costs confronts them if labor gets another round for which demand is expected late next quarter. Nickel and tungsten alloy bar prices will probably advance shortly, reflecting higher costs of those alloying elements, grades taking more than five per cent nickel. Alloy bar

schedules are hampered by delays and suggested changes in approval of melt sheets.

**Philadelphia**—Hot carbon bar producers have received most CMP allotments for September and are now engaged in setting up schedules before the deadline of July 15. There will be some "free" tonnage, although the volume will be down from the preceding month, especially in view of expected arrearages at the end of August. In addition to CMP allotments for September, they are also receiving some for fourth quarter.

**Chicago**—Despite curtailed operations in the automotive industry, demand for forging billets and cold-finished bars is unabated. Barmakers' schedules are virtually completely filled for third quarter with DO and other rated business.

## Plates . . .

Plate Prices, Page 129

**Philadelphia**—Most plate consumers have certified their DO-rated tonnage for September under the CMP program. While July 7 was the official deadline, an overflow into July 9 is expected and may be given consideration in view of the weekend circumstances.

Where CMP allotments are larger than their scheduled DO-rated tonnages for September, mills are expected to work in the extra amounts at the expense of such other DO-rated tonnages as may not be certified. This will not be done at the expense of unrated work; there will be so little free tonnage available that Washington prefers to keep it reasonably intact so as to support operations at plants engaged in civilian work. On the other hand, there may be some cancellations where CMP allotments do not equal the amount that various consumers may have been able to place under DO-ratings for September. Thus, cancellations may tend to offset extra allotments with a minimum disruption otherwise.

One difficulty confronting some consumers relates to the recent increase of 5 per cent in the DO set-asides, half of which tonnage is for maritime work and the remainder for tank cars. Tank car tonnage is principally that rolled on wide mills and various producers haven't either the facilities or the capacity left to handle such type of work.

The Coatesville producer, which suspended operations on its 140-inch mill for ten days beginning July 1, for repairs, has started work on construction of two 2 million-gallon oil storage tanks. These facilities will provide a reserve for use whenever there is a shortage in gas supply.

Under a recent order, M-46, all oil country goods rated DO-48 have been automatically converted to CMP. It is understood DO-97, having to do with maintenance, repairs and operations, also has been converted.

**New York**—Plate sellers received a heavy volume of orders last week covering the conversion of DO tonnage to CMP allotments. Consumers tried to beat the deadline of July 7 for such conversion. Work this week will be devoted largely to arranging schedules and, if possible, booking some "free" tonnage before the expiration of the 45-day lead time for September.

ber. However, it is doubtful if much unrated tonnage can be worked in, particularly in view of the heavy set-asides for defense work and the probable arrearages at the end of August. Some CMP allotments are being received for the fourth quarter. Consumers protected by CMP are permitted to order in advance of 70 per cent of what they are scheduled to receive under priority in the third quarter. Later, when final allotments are made for fourth quarter, this percentage may be revised upward.

**Boston**—Plate fabricating shops using 400 tons or less annually look for better times under CMP. Most users in this category have allotments certified. Many in this group qualify as warehouse buyers, but base plate quotas with distributors against 85 per cent allocation from mills are low.

**Pittsburgh**—Demand for light and heavy plates continues active with defense requirements and directives taking larger portions for July. Building construction demand for plates eased last week, but not enough to be reflected in plate supply.

## Reinforcing Bars . . .

Reinforcing Bar Prices, Page 129

**Seattle**—Bethlehem Pacific Coast Steel Corp.'s local plant has a large backlog and will continue operations during vacation period. Northwest Steel Rolling Mills Inc., this city, is down for the first two weeks in July for overhaul and repairs. Pressure for reinforcing bars is insistent and producers continue to refuse orders beyond capacity. Delivery on new business is about six months in advance.

## Structural Shapes . . .

Structural Shape Prices, Page 129

**New York**—Pending clarification of the effect of CMP on future supply of shapes, there is a general hesitancy by both fabricators and contractors to figure on work that is not definitely of a defense or important public character. There is much tonnage that may be approved ultimately by Washington, but wherever there is doubt there is disposition to coast for the time being. Fabricators are particularly concerned about obtaining steel for work already being processed, rather than obtaining new contracts. Some have unrated jobs that they have had on their books for a considerable time and in some cases have progressed with the fabrication only to find themselves tied up by lack of steel. Relief likely will be provided in these cases, but it has been slow coming through. Fabricators are even having trouble obtaining steel for rated work. Some believe that by the end of the third quarter, if not before, they will be justified in either canceling, or setting back indefinitely, various unrated jobs because of the steel shortage. In such an event, backlogs instead of being extended 12 to 14 months, as was the case earlier in the year, may be cut in half.

**Boston**—Not only are construction restrictions and controls over plain material curbing fabricated structural steel inquiry, but prices and costs are putting a damper on some public work and marginal projects. Bridge



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steel quotations and other materials are consistently over office engineer estimates. Reversal in the price trend however, is reflected in unit bids on fabricated and erected structural steel for the last two superstructure contracts bid less than one month apart for Central Artery, Boston. Both are large tonnage inquiries totalling 19,000 tons. Shop and field work is similar. For carbon structural steel for bents, the low price fell to 23.65c per pound from 25.20c and on silicon steel to 25.70c from 28.30c. These prices were quoted by the same shop, both contracts.

**Pittsburgh**—Structural demand is increasing slightly, with emphasis on light beams and channels. Heavy industrial and rated construction keeps demand at peak. Defense requirements and directives account for as high as 85 per cent of one producer's output. Building bans by NPA have not made any significant additional tonnage available for the non-rated purchaser, and little relief is expected until fall.

**Seattle**—Heavy structural placements are pending. Plants are booked well forward. There is some difference of opinion as to the effects of CMP. The supply situation is serious and fabricators hesitate to bid beyond current steel inventories.

## Wire . . .

Wire Prices, Page 131

**Boston**—Rod and wire consumers in this area normally buy 76 per cent of requirements from New England mills. With advent of controls and heavier demand this ratio roughly holds. But available tonnage, notably rods, has not kept pace. Rod producers, to meet conversion allocations, sell tonnage at expense of their own finishing operations and in turn, semifinished to nonintegrated mills fall short of requirements. About 335,350 tons of rods went into finished wire in New England last year.

**Chicago**—Some easing in demand for nails is anticipated by producers as a result of government restrictions imposed on home construction. All other wire products are expected to continue tight.

Joliet and Waukegan, Ill., plants of American Steel & Wire Co. closed for two weeks starting July 2 for the annual vacation. Neither plant makes raw steel.

## Stainless Steel . . .

Stainless Steel Prices, Page 133

**Pittsburgh**—Two leading producers of stainless steels advanced prices to cover the increased cost of nickel, which rose 6 cents a pound June 1. Other producers are expected to take similar action soon.

Allegheny Ludlum Steel Corp. advanced prices June 26 on nickel-bearing products after absorbing the cost of the first 5 per cent of contained nickel. The price advance applies to all company produced steels containing more than 5 per cent nickel and includes stainless, high temperature and electrical alloys. The advances cover the actual increase in nickel costs only and, to reflect these actual increases, prices have been calculated to the fraction of a cent.

United States Steel Co.'s subsidiaries revised nickel-bearing product prices on July 2. The advances ranged from ¼-cent to 1 cent a pound.

## Pig Iron . . .

Pig Iron Prices, Page 128

**Chicago**—Jobbing foundries are taking all the iron allocated to them by suppliers despite the fact that melting rates on the whole are down somewhat. Nevertheless, jobbing shops are holding up better than automotive foundries which are affected by limitation orders on car assemblies. Vacation shutdowns now starting are reducing iron consumption, but are not interfering with the intake of raw materials during such period. Of the district's 42 blast furnaces, 41 are operating.

**New York**—With various foundries back in operation after a week's suspension for vacations, pressure for pig iron is extremely heavy, although some plants are still down for another week for vacations. Only a relatively few foundries have been forced to curtail operations because of shortage in pig iron. Most of them have little inventory, but have been able to keep "heads above water." Where there are curtailments, they are due primarily to an easing in demand from consumers of castings, some of whom report a falling off in demand for products for which castings are the major components; some, because of inability to obtain other components with which to complete assemblies.

**Buffalo**—Unless Korean peace moves alter the situation, not much change is expected at this time in the merchant pig iron market. Melting operations have been pared by vacation periods, but consumers are not postponing delivery dates. To make sure stock is received, small forces are kept on to handle receipts. Defense work is expected to be heavy even after the Korean war ends.

The consumer with the only idle stack in the area is expected to relight that unit within the week, but another stack will go down shortly for relining.

**Philadelphia**—Pressure for foundry iron was lighter last week due to suspensions at various plants for vacations. However, consumers likely will take up all iron offered. Demand for basic is sustained at a high rate, ingot operations holding close to capacity or higher.

**Pittsburgh**—Demand pressure for all grades of pig iron is high, partly because of the scrap shortage. Although demand is great and supply limited, no foundry has curtailed operations for this reason. With some foundries taking combined vacations, it is hoped pig iron inventory can be built during the period. Production continues at peak levels.

**Cincinnati**—Foundry vacations are cutting the melt in this district, but demand for pig iron shipments continues heavy for stockpiling.

## Iron Ore . . .

Iron Ore Prices, Page 135

**Cleveland**—Shipments of Lake Superior iron ore rose to a new peak for the season to date and exceeded last year's best rate, amounting to 3,145,203 tons. This brought the cumulative total to July 2 to 32,651,692 tons compared with only 22,019,932 tons for the like period a year ago. The increase for the season over last year for United States ports alone amounts to 10,486,610 tons.

**Youngstown**—First large scale shipments of iron ore from Liberia are being smelted in Republic Steel Corp.'s Youngstown and Warren open-hearth plants. Republic's Youngstown plant got 33 carloads and the Warren plant got 17 carloads as their share of the 10,000 tons that arrived in the first shipment to Baltimore. Republic executives here expect regular shipments will enable them to boost output sharply here, since the ore replaces Old Bed Ore from New York state as the open-hearth charge ore.

## Warehouse . . .

Warehouse Prices, Page 135

**Pittsburgh**—Distributors are receiving around 85 per cent base period receipts as specified under M-6, but increased receipts go into greater sales volume with no possibility for inventory-building. Under CMP, high demand levels with limited receipts will continue to prevail. Hot and cold-rolled carbon and alloy bars, all sizes, are the scarcest warehouse product. Plates and hot and cold-rolled sheets are in critical supply, along with structurals. Some warehouses have received rated inquiries for steel in production quantities in hopes that better deliveries can be promised. Distributors are naturally reluctant to accept such orders.

**Boston**—Alloys, including stainless, and tool steel, largely distributed through warehouse, usually account for better than 20 per cent of total bar tonnage in this area. Alloy stocks with distributors are far below normal. Replacement depends on passing on defense certificates against warehouse orders. Demand has slackened little.

**New York**—Certification of requested CMP steel allotments in full to small consumers will include many who buy in warehouse quantities. Users in this category, unless over-estimating requirements, get about what they ask in terms of tonnage. Quarterly requirements defining small users are: carbon steel, 100 tons; and stainless, 500 pounds. With

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ore warehouse quantity buying like-  
85 per cent allocation to distribu-  
rs may be overloaded, notably where  
se quotas on some carbon products  
e low.

**Philadelphia**—Distributors antici-  
ate at least as much tonnage from  
the mills in July as they got in June.  
ordinarily, July would be less active  
view of vacation at various metal-  
working plants. Demand is so greatly  
in excess of supply this year, ware-  
houses believe business during the va-  
cation period will be governed by the  
amount of steel they have to sell.

**Cincinnati**—Warehouses are receiv-  
ing more extensive lists of wanted  
steel, as fabricators' reserves shrink.  
Mill shipments are far below M-6 ton-  
nage, so that jobbers' stocks generally  
are at the year's lowest level.

**Chicago**—Consumer pressure for  
warehouse steel is somewhat less in-  
tense than had prevailed for many  
weeks, but the easing is growing no  
deeper. Individual orders are for few-  
er items and for smaller quantities.  
Buying also is mainly for short term  
use. Nevertheless, total volume is  
more than distributors can accommo-  
date. Building up of stocks still is  
impossible. Among tightest items are  
cold-finished bars, structurals and  
plates.

## Tungsten Ore . . .

**Washington**—Tungsten production  
is being resumed on a small scale at  
the San Dong mine in Korea. War  
damage suffered by this mine was  
confined largely to surface equipment,  
but production is not expected to in-  
crease rapidly because of parts re-  
placement problems and the disloca-  
tion of labor.

China was formerly the principal  
source of tungsten for the United  
States. General Services Administra-  
tion is contracting for most of the  
Siamese tungsten production. Al-  
though GSA has contracted for more  
than 1 million pounds of tungsten ore  
on the world market, considerable  
doubt is expressed by government of-  
ficials that this quantity will reach  
this country. To keep production of  
all tungsten-using industries at a nor-  
mal level, imports of 800,000 pounds  
of tungsten-bearing ore is needed  
monthly.

Domestic production in April  
amounted to 507,000 pounds compared  
with 585,000 pounds in May. Pre-  
Korea production was about 450,000  
pounds monthly.

## Metallurgical Coke . . .

Metallurgical Coke Prices, Page 133

**Pittsburgh**—Oven coke demand has  
slackened slightly as most foundries  
concentrate on obtaining pig iron and  
scrap. Some steel mills and foundries  
have been able to build small inven-  
tories of coke. Few purchasers have  
taken Connellsville beehive foundry  
in preference to oven grades and as a  
result the former market is slow.  
Shipments of this grade to other con-  
suming areas continue. Market will  
become slower here through this  
month because of vacations and re-  
pair of one blast furnace. If coke  
users decide to accumulate large in-  
ventories, smaller users may have dif-  
ficulty later in obtaining full require-  
ments.

**Chicago**—Foundry coke demand is  
considerably easier. This is attributed  
to lower operations of automotive  
foundries and fact that jobbing found-  
ries are less anxious than formerly to  
stockpile fuel.

## Scrap . . .

Scrap Prices, Page 136

**Pittsburgh**—All grades of scrap are  
moving somewhat slower here due to  
summer vacations, retooling for de-  
fense items and the actual scarcity of  
material. Dealers and brokers are at-  
tempting to achieve an equitable dis-  
tribution of limited supplies, but vary-  
ing demand for different grades makes  
the task difficult. Practically no re-  
serves are held by steel plants and  
foundries; operations in some cases  
have been curtailed because of the  
shortage. Proposed lumping of grades  
into one designation might eliminate  
upgrading, but would not cause the  
scrap to move faster.

**New York**—While steel scrap sup-  
ply is increasingly scarce, some easing  
in cast grades is reported. Some  
plants, which have been taking up-  
graded material, have developed suf-  
ficient inventories to hold them for  
a while and this situation is tending  
to free supply for other users who  
have been refusing to take such mat-  
erial. Some dealer steel scrap is being  
allocated by Washington for the first  
time.

**Buffalo**—Uncertainty gripped the  
scrap market here as dealers were  
wary over what might happen in the  
event of peace in Korea. While a

peaceful settlement is not expected  
to bring about any appreciable change  
immediately, the market did show its  
first sign of easement as dealers re-  
ported supplies of cast material had  
increased to a point that no ceiling  
bids were left unfilled. No sales were  
reported under control levels. The  
cast situation also had as a factor a  
vacation shutdown of one of the lead-  
ing consumers of this item. Steel-  
making grades continue tight and  
strong.

Two barge fleets, carrying approxi-  
mately 7000 tons, arrived during the  
week from the eastern seaboard.

**Philadelphia**—For the first time,  
basic open-hearth scrap at dealers'  
yards has come under allocation. This  
reflects the growing stringency at  
some mills and the desire of govern-  
ment officials to keep scrap developed  
locally from going outside the district.  
Scarcity in steel grades is accentuated  
by shrinkage in industrial scrap due  
to curtailment of operations at vari-  
ous metalworking plants for vaca-  
tions. Cast supply is somewhat easier  
as some consumers who have been  
taking upgraded material are in a  
fairly comfortable position and are  
leaving more tonnage available for  
other consumers.

**Chicago**—Some slight improve-  
ments in scrap inventories are being  
achieved here as receipts of melting  
material exceed consumption.

Gary works of United States Steel  
Co. now has 6½ days supply versus  
6 days during past two weeks. NPA  
has issued scrap allocation directives,  
but the tonnage is only starting to ar-  
rive. Inventory level at the com-



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pany's South Works is now 10 days.

While all mills expect to hold or improve their positions during the next several months, prospects for building substantial stocks for winter are dim.

**Detroit**—Scrap generation in automotive plants was about at the same level in June as in May. A decline is likely, of course, in July. The number of instances where scrap is moving from dealers' yards under government allocation has increased and is now prevalent on the Detroit perimeter, although not yet in the city.

**Cincinnati**—Reliance on allocations of iron and steel scrap is on the up-trend. Predictions are that 80 per cent of tonnage will be on directives within two or three weeks. Mill reserves are low, with slight chance at improvement. Comparatively, cast is in better supply. District collections are sagging.

**Seattle**—Scrap receipts are increasing, but the rate of consumption is so high it is impossible to add to stockpiles and prepare for winter needs. Dealers are co-operating with mills in the scrap mobilization program. Additional offshore shipments are needed to care for the local situation. One Seattle plant has just received a 5000-ton cargo from Honolulu.

## Conservation Programs Lag

Conservation programs in some respects are bogging down. An apt case is solders; earlier research centered around saving of tin with increased use of lead, silver and other metals in mixtures. Shortages have spread to other metals required in larger amounts for saving tin and no longer are researchers able to save one metal at expense of another. Not much progress one way or another is expected until there is an easing in one or more metals required in solders and this is not in sight.

Supplies of nickel are extremely tight, forcing consumers in this country to invoke conservation measures. By using smaller amounts of nickel with copper for flash plating, producers of electric houseware products, irons, toasters, hot plates, etc., are conserving considerable nickel, although small amounts are needed in plating to prevent corrosion; one company has reduced use of nickel anodes from 10,000 to 2000 pounds per month. This industry by overall conservation methods has reduced consumption of nickel by 50 per cent. Canning machinery builders are also saving nickel, substituting nickel silver, containing 18 per cent nickel, for a higher alloy with upwards of 62 per cent. Nickel alloys may be eliminated in all parts except those coming in direct contact with food.

Use of nickel for plating is restricted by an increasing number of industries, among them household sewing machines; only on functional parts, in contact with goods and thread, is nickel used for plating. For other parts, various corrosion-resisting processes are employed, bonderizing, Parkerizing and japaing. Some are bright zinc-coated, but tin is also costly, although price is lower since earlier in the year.

Copper for fractional horsepower sewing machine motors may become a limiting factor, but on whole mate-

rial shortages have not substantially reduced production. Unless military requirements go over estimates, enough secondary aluminum is in sight for die-cast heads, also magnesium for some portable machine heads. Manufacturers are getting enough cast iron heads.

## Lead and Tungsten Quotas

Export quotas of 1800 short tons of lead and 6000 pounds of tungsten for licensing during the third quarter of 1951 were announced last week by the Office of International Trade.

The same quantities were established for licensing in the second quarter.

The lead quota covers lead ore, concentrates, matte, and base bullion (lead content); scrap; pigs, bars and anodes; sheets and pipes; solder; and all types of lead manufactures (schedule B Nos. 650406-651598). The tungsten quota covers tungsten metal, stellite, wire shapes, alloys and carbide, except carbide tool blanks, tips, and inserts (schedule B No. 663900).

## Canada . . .

**Toronto, Ont.** — R. H. Saunders, chairman, Ontario Hydro Electric Commission is overseas seeking to obtain more steel for the Hydro expansion program and to speed up delivery of steel already on order. Steel for the Hydro expansion has been promised at a rate of 1000 tons monthly until the 13,000 tons required from this source has been met.

For the 12 months commencing July 1, 1951, the Ontario Hydro Electric Commission will require an estimated 54,387 tons of steel to carry through its expansion program on schedule. For the balance of this year, Hydro needs 26,973 tons of steel of which 14,206 tons will be needed in third quarter and 12,767 tons in fourth quarter. Included in these requirements are structural steel, reinforcing bars, conduit and pipe.

Directors of Dominion Steel & Coal Corp., Sydney, N. S. have approved expenditure of \$16 million in the third stage of its expansion program. Improvements at Sydney Works will enable the company to maintain an uninterrupted annual production of 720,000 tons of ingot steel and process this steel to finished products.

## Manganese Ore . . .

**Philadelphia**—Recently, 5000 tons of manganese ore were imported from Greece, the first from that source to have been reported in a long time.

## STRUCTURAL SHAPES . . .

### STRUCTURAL STEEL PLACED

675 tons, state bridge, Essex county, New Jersey, to Phoenix Bridge Co., Phoenixville, Pa.

600 tons, power plant for Alaska Railroad, Anchorage, to Pacific Car & Foundry Co., Seattle.

565 tons, boiler supports, Combustion Engineering Co., Kansas City, Mo., to American Bridge Co., Pittsburgh.

350 tons, radio chemistry building, Hanford,

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Ambassador 2-6700

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**DAVENPORT, Iowa**  
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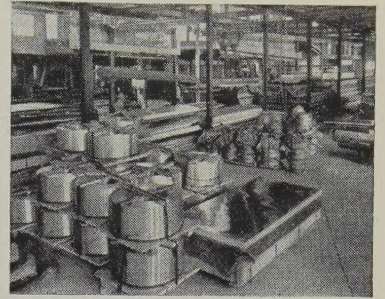
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290 tons, elementary school building, New Britain, Conn., to Standard Structural Steel Co., Hartford, Conn.; Southern New England Construction Co., Hartford, general contractor; Scherer Steel Co., 50 tons, reinforcing bars.

250 tons, Alaska Road Commission bridges, to Pacific Car & Foundry Co., Seattle; J. J. Badraun, Seattle, general contractor.

210 tons, factory Becton-Dickinson, Rutherford, N. J., to Bethlehem Fabricators Inc., Bethlehem, Pa.

185 tons, plant construction, Little Falls, N.J., to J. G. Schmidt Iron Works, Passaic, N. J.

155 tons, construction work, American Viscose Corp., Parkersburg, W. Va., to Bethlehem Steel Co.

150 tons, galvanized, switchyard structures, Gulf States Utilities Co., Beaumont, Tex., to Muskogee Iron Works, Muskogee, Okla.; Stone & Webster Engineering Corp., Boston, engineer-contractor.

100 tons or more, high school, Torrington, Conn., to Berlin Construction Co., Berlin, Conn.; bars to Topper & Griggs, Hartford, Conn.; Bonvicine Building Co. Inc., Torrington, general contractor.

#### STRUCTURAL STEEL PENDING

4900 tons, warehouses, Army Engineers, Tobyhanna, Pa.; bids closed July 6; bids on 6125 tons to be asked later.

1500 tons, tainter gates, stop logs, etc., Chief Joseph dam, Washington state; Consolidated Western Steel Corp., Seattle, low, \$963,730.

Unstated, schedule No. 2, Chief Joseph dam; Northwest Marine Iron Works, Portland, low to U. S. Engineer, \$459,000.

Unstated, 38 crest gates, for Rock Island dam project, Washington state; bids to Stone

& Webster, Boston, July 23.

Unstated, alert hangar, McChord Air Field, Washington state; J. H. Sellen, Seattle, low \$379,391.

#### REINFORCING BARS . . .

##### REINFORCING BARS PLACED

1100 tons, hangar and other work, Elelson air force base, Alaska, to Bethlehem Pacific Coast Steel Corp., Seattle; Morrison-Knudsen Co., general contractor.

350 tons, contract E-3, deck and structures, Embankment road connection, Central Artery, Boston, to Bethlehem Steel Co.; V. Barletta Co., Boston, general contractor.

115 tons, home for aged, Hartford, Conn.; 80 tons of bars to Scherer Steel Co., Hartford, and 35 tons of structurals to Lehigh Structural Steel Co., Allentown, Pa.; Southern New England Construction Co., Hartford, general contractor.

##### REINFORCING BARS PENDING

400 tons, Rock Island power dam construction; bids to Stone & Webster Engineering Corp., Boston, July 27.

350 tons, bulk storage facilities, Mukilteo, Wash., Navy terminal; Dahlgren Construction Co., Seattle, low \$1,429,856.

Unstated, (plates also involved) ground storage and elevated tank, Mountain Home base, Idaho; J. H. Wise & Sons, Boise, low to U. S. engineer, Walla Walla, Wash., \$192,547.

#### PLATES . . .

##### PLATES PLACED

2460 tons, tanks for various locations, Cities Service Oil Corp., to Chicago Bridge & Iron Works, Chicago.

130 tons, 1 million gallon stand pipe, Fairlawn, N. J., to Chicago Bridge & Iron Works, Chicago.

#### PLATES PENDING

2300 tons, 5 million-cubic gas holder, Philadelphia Gas Works Co.; bids asked.

1650 tons, gas holder, Allentown-Bethlehem Gas Co., Allentown, Pa.; bids closed.

1650 tons, gas holder, Harrisburg Gas Co., Harrisburg, Pa.; bids closed.

Unstated, additional storage facilities, Navy supply depot, Manchester, Wash.; MacRae Bros., Seattle, low \$674,340.

#### PIPE . . .

##### STEEL PIPE PENDING

Unstated, 14,850 feet of 8 to 4-inch steel water pipe, Aloha-Huber district, Portland, Oreg.; E. N. Dolan, Portland, low \$32,506.

#### RAILS, CARS . . .

##### LOCOMOTIVES PLACED

Baltimore & Ohio, 8 diesel-electric switching locomotives, to Electro-Motive Division, General Motors Corp., La Grange, Ill.

Maine Central, two diesel-electric locomotive units, to Electro-Motive Division, General Motors Corp., La Grange, Ill.

Richmond, Fredericksburg & Potomac, three 2-unit 4500-hp diesel-electric locomotives, to Electro-Motive Division, General Motors Corp., La Grange, Ill.

##### RAILROAD CARS PLACED

Baltimore & Ohio, 500 seventy-ton covered hopper cars, to Greenville Steel Car Co., Greenville, Pa.

New York, New Haven & Hartford, 550 seventy-ton hopper cars, to Pullman Standard Car Mfg., Chicago.

Wabash, 300 fifty-ton box cars, to General American Transportation Corp., Chicago.

##### RAILROAD CARS PENDING

United States Army, 400 fifty-ton box cars; bids asked.

Western Pacific, 500 gondola cars; bids soon.

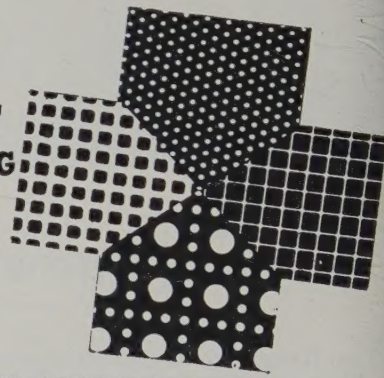
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